

NO-A162 487

PRODUCTIVITY IMPROVEMENT BY THE CRANFORD SLIP METHOD

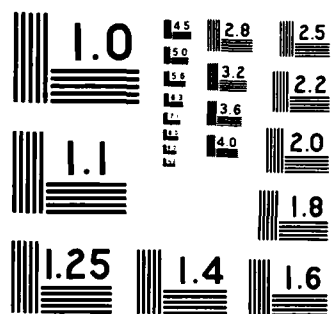
1/1

UNCLASSIFIED

F/G 5/1

■

[illegible]



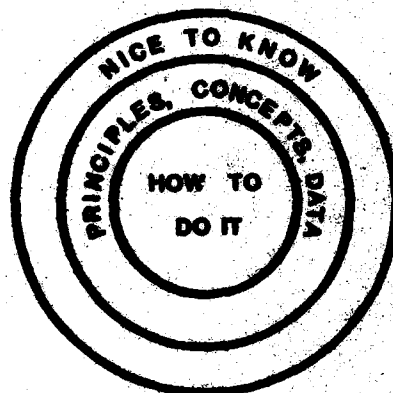
2

PRODUCTIVITY IMPROVEMENT BY THE CRAWFORD SLIP METHOD

HOW TO WRITE, PUBLISH, INSTRUCT, SUPERVISE, AND MANAGE
FOR BETTER JOB PERFORMANCE

BY C. C. CRAWFORD, JOHN W. DEMIDOVICH, AND ROBERT M. KRONE

AD-A162 487



FOCUS ON PERFORMANCE

DTIC
ELECTE
DEC 13 1985
S A D

DTIC FILE COPY

This document has been approved
for public release and sale; its
distribution is unlimited.

CONTENTS

1. CHALLENGE TO IMPROVE	Why change present ways of getting good work done	3
PART I. PRODUCTIVITY ANALYSIS		
How to assess needs and find better ways		
2. NEEDS	How to spot troubles	5
3. BETTER WAYS	How to find remedies	7
4. CLASSIFICATION	How to organize slips	9
PART II. APPLIED INSTRUCTION		
How to direct learning of tasks		
5. OVER-ALL DESIGN	How to teach so learners can perform	10
6. MOTIVATION	How to create a wish to learn the task	11
7. DIRECTIONS AND EXPLANATIONS	How to impart insights to guide actions	13
8. TRIAL PERFORMANCE	How to manage the learning by doing	15
9. EVALUATION	How to deal with successes and failures	16
PART III. APPLIED AUTHORSHIP		
How to put know-how on paper		
10. HANDWRITTEN METHOD	How to compose on slips	18
11. DICTATION METHOD	How to dictate know-how	21
12. WORKSHOP METHOD	How to do procedure writing	24
PART IV. PUBLICATION		
How to reach your intended learners		
13. PRINTED PUBLICATION	How to distribute know-how on paper	26
14. NON-PRINTED PUBLICATION	How to distribute know-how by the new technologies	29
PART V. IMPLEMENTATION		
How to get know-how used productively		
15. SUPERVISION	How to individualize know-how applications	33
16. MANAGER ROLES	How to support the improvement process	35
17. THINK TANK	How to institutionalize know-how transfer	37

The Crawford-Demidovich-Krone book, "PRODUCTIVITY IMPROVEMENT BY THE CRAWFORD SLIP METHOD: How to write, publish, instruct, supervise, and manage for better job performance" (40 pages, \$3.00 plus sales tax within California, 1984), is published by the University of Southern California School of Public Administration. Order or buy from University Bookstore, USC, Los Angeles, Ca 90089-0032, Tel. 213-743-2601. The 17 chapters are in five parts:

PART I. PRODUCTIVITY ANALYSIS: Needs, better ways, organization
 PART II. APPLIED INSTRUCTION: Over-all design, motivation, directions and explanations, trial performance, evaluation
 PART III. APPLIED AUTHORSHIP: Handwritten, dictation, workshop
 PART IV. PUBLICATION: Printed, non-printed
 PART V. IMPLEMENTATION: Supervision, management, think tank

The Crawford-Demidovich book, "CRAWFORD SLIP METHOD: How to mobilize brainpower by think tank technology" (64 pages, \$3.00 plus sales tax within California, 1983), is published by the University of Southern California School of Public Administration. Order or buy from University Bookstore, USC, Los Angeles, Ca. 90089-0032, Tel. 213-743-2601. Chapter titles are:

1 THINK TANK GOALS: For what reasons or purposes to mobilize ideas on slips
 2 MENTAL LOW GEAR: How to mobilize your own brainpower
 3 ENRICHMENT FROM OTHERS: How to mobilize others' brainpower
 4 ORGANIZATION: How to classify and handle slips
 5 FEEDBACK AND OUTPUT: How to recycle what is assembled
 6 PROCEDURE WRITING: How to standardize some critical tasks or interactions
 7 AUTHORSHIP AND IMPLEMENTATION: How to move from think tank to productivity
 8 CASE EXAMPLES: Some illustrative working papers

PRODUCTIVITY IMPROVEMENT

BY THE CRAWFORD SLIP METHOD

HOW TO WRITE, PUBLISH, INSTRUCT, SUPERVISE, AND MANAGE FOR BETTER JOB PERFORMANCE

By

C. C. CRAWFORD, Ph.D.

Research Consultant, School of Public Administration

Distinguished Lecturer, Institute of Safety and Systems Management

University of Southern California

JOHN W. DEMIDOVICH, Ph.D.

Professor of Management

Air Force Institute of Technology

Wright-Patterson Air Force Base

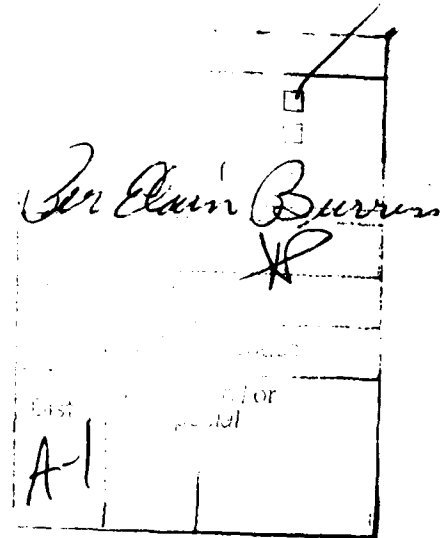
ROBERT M. KRONE, Ph.D.

Associate Professor of Systems Management

Institute of Safety and Systems Management

University of Southern California

NOT COPYRIGHTED. REPRINT FREELY. PLEASE CREDIT THE SOURCE.



PUBLISHED BY THE SCHOOL OF PUBLIC ADMINISTRATION

July 1984

University of Southern California
University Park MC 0041
Los Angeles, California 90089-0041

Order or buy from USC Bookstore
Los Angeles, Ca 90089-0892
Telephone 213-743-2601

FOREWORD BY ROSS CLAYTON, Ph. D.
Dean, School of Public Administration
University of Southern California

One mission of a university is to be an instrument of change in industry, business, government, and the whole social order. Instruction can preserve what is known, and research can develop what needs to be. New courses and new research methods can focus intellectual effort on societal problems and develop better solutions.

The University of Southern California accepts that challenge to be a change agent for better ways of life and work. This new Crawford-Demidovich-Krone book can help us meet that challenge.

Universities instruct professionals, managers, leaders, planners, and improvers of many kinds. This instruction begins with preservice courses for undergraduates. It continues with graduate and in-service courses or projects for alumni of their own or other universities. These mid-career learners are the prime movers at the forefront of social progress. Universities can help them to get more work done better with less. That is what productivity is all about.

This book's emphasis on applied instruction is an asset in bridging the gap between academia and the world of work. It makes it easier to develop new courses to meet new and unique needs in special employee groups or professional activities. We welcome requests for specially designed courses or projects for specific kinds of useful endeavor.

The book's emphasis on applied authorship is a significant advance toward offering specially designed courses for unique professional or organizational needs. A course on "Authorship for Productivity" can be based on this book and the 1983 Crawford-Demidovich book, "Crawford Slip Method." Such a course can help to build an interdisciplinary think tank of authors, editors, researchers, and problem solvers for any part of our social order. Such a think tank can be a service to your university and to other organizations that build a similar capability for whatever needs improving.

The authors have already gained significant momentum in such fields as defense, the civilian economy, government, and higher education itself. This book can play an important role in rendering many national services.

AUTHORS' PREFACE

This book's mission is to help our nation's economy to get more work done better with less. Precision, quality, and efficiency can come from brain-power mobilization to find better ways. Reasons why the Crawford slip method can help follow.

1. Deeper penetration into specifics. You can "interview" a whole audience at once. You get each person's unique insights independently of what others think, each from a special vantage point. You see into vastly more crannies of your situation. Those close to the details give you the help you need.

2. Release from fear. Employees wish they could "tell the boss a few things," but don't dare. Managers want more inputs than can come through the curtain of fear. Anonymous slip writing lets the truth come through.

3. Speed. Ideas come in at a rate of about one slip per minute per person, infinitely more than by oral methods.

4. Recycling know-how. The looseleaf feature, one sentence per slip, makes organizing faster and better. The composite can be fed back to far more people than wrote slips. This includes learners, managers, planners, and improvers of many types.

5. Mutual aid. In a complex activity few people have sole control of anything. Each depends on others. Linkages and interactions are often imperfect. People don't understand each others' terminologies, constraints, or motivations. They go in separate ways. The Crawford slip method can improve these interfaces. See Chapter 12 for how.

6. Wholeness. You get the "Big Picture" by assembling the specifics, as in a jigsaw puzzle. The slips are the pieces. When assembled they make you "monarch of all you survey." We invite inquiries about how we may help you to get started in applying this method. Addresses follow.

Dr. C. C. Crawford, 3832 Mt. Vernon Dr., Los Angeles, Ca 90008, Tel. 213-294-5015 or 213-743-2241

Dr. John W. Demidovich, AFIT/LSB, Wright Patterson Air Force Base, Ohio 45433, Tel. 513-255-4549 or 513-878-3850

Dr. Robert M. Krone, Institute of Safety and Systems Management, USC, Los Angeles, Ca 90089-0021, Tel. 213-743-5382 or 714-888-2773

CHAPTER 1. CHALLENGE TO IMPROVERS WHY CHANGE PRESENT WAYS

Thousands on thousands of written inputs about productivity have come to us in the past few years. They were from workshop audiences of workers, technicians, supervisors, managers, and many other specialized people. Some audiences were heterogeneous. Most were for a single type. The following terms illustrate a small sampling of the single types: Accounting, arts, banking, broadcasting, business, charity, church, computers, contracting, death and dying, education, energy, engineering, estate planning, financial control, forecasting, fund raising, geriatrics, gerontology, health care, insurance, libraries, logistics, manufacturing, marketing, marriage, military defense, personnel, politics, recruiting, research, security, senior centers, systems management, training, and many more. Inputs from such audiences form the data base for this book.

Those inputs were **INDEPENDENT**, not echoes of others' views. They were **ANONYMOUS**, safe from censorship and fear. They were **LOOSELEAF**, easy to classify. The workshops were run by the Crawford slip method. They were in several nations, but mostly in the United States. More about the method will come later.

1. Image of present performance. Like a chorus those slips tell us three things about the world of work:

- a Many of their subordinates are judged incapable, unqualified, or poorly trained for their assigned tasks.
- b They themselves are unsure about some tasks, about details of subordinates' tasks, and about how to upgrade those tasks.
- c They wish for more and better manuals, directions, and guidelines than they now get from above. Yet few say a good word about the available "rules and regulations."

Those three complaints have come from all levels and all kinds of work with such consistency and in so many wordings that we **MUST** take them seriously. Whether about workers, first line supervisors, middle managers, staff specialists, top management, or on up to Congress and the voters, there is a general perception that much work and decision making is done by people who simply **DON'T KNOW**.

2. Present ways of learning. A typical way in a job is to "learn by experience." That is a polite term for **TRIAL AND ERROR**. Many start near zero in a new task or project. By the time they have half-way learned it they may be transferred or promoted or quit, to be replaced by someone who starts near zero. The know-how level declines a bit with each job turnover. This is a big factor in what Dr. Simon Ramo's book, "AMERICA'S TECHNOLOGY SLIP," describes so vividly. (John Wiley and Sons, 1980.)

No amount of typical preservice education can stop this slump. At best the classes and courses can teach only the fundamentals that are **APPLICABLE** to

many jobs. But **APPLYING** these to specific jobs is not so easy. Each job, task, or assigned project has many **UNIQUE** features. Each company, agency, or organization has its own unique facilities, equipment, interrelationships, interactions, and procedures. For a new individual these can be as baffling and perplexing as the most complex crossword puzzle. A vast amount of learning must be done on an **IN-SERVICE** basis.

3. Recycling of know-how needed. On-the-job learning calls for **APPLIED AUTHORSHIP**, written directions, and agreed-on best ways. These should be in print for all, or at least for posting near desks or benches. We need to recycle more of what the experienced ones have learned, as a head start for new learners. Oral transfer is utterly inadequate. On-the-job training now ranges from haphazard to non-existent. Even when done, it is almost always oral, unrecorded, likely to be misunderstood, or inaccurately remembered.

We need a new breed of authors to capture, record, and recycle the unrecorded job know-how that is now bottled up in individual brains. The Crawford slip method makes that kind of authorship feasible and affordable.

But the improving does not stop with mere authorship. It includes also publication, instruction, and supervisory or managerial implementation, to see it through to mastery, precision, and efficiency. That is what this book is all about. Unless the needed know-how is on paper or otherwise available to the learners, the other improvement efforts may be mere spinning of wheels. Neither the individual tasks nor the chain of events and interactions can be very good unless those who do them know what is expected and how to perform. Applied authorship is a good starting point. It is simply the writing of directions for tasks or interactions. The other functions are made better when based on well recorded and presented directions. Productivity depends heavily on this. Trial and error is not good enough.

4. Shortcomings of group instruction for jobs. The image of group instruction (courses and classes) is not good, whether given by universities or employers. Typical complaints are illustrated by the following, selected from thousands like them: Assignments don't match training; classes as escape from work; content by instructor whim; costly; education but not training; erroneous content; evaluation lacking; foundational only; funds lacking; hard to get; ideas but not actions or skills; informing but not directing; knob twisting without knowing why; lecture method; loose ends; loss of production while attending; low priority with management; management coordination poor; manuals poor or lacking; non-existent courses; obsolete content; optional with employees; poorly conceived; pre-assignment only; preservice only; quality control lacking; "start poor and go to Hell from there"; teaching skills low; technical jargon; technical knowledge low;

theoretical; time too short; too few courses; trained ones leave; unapplied; under-supported by management; unique needs not met; unprepared or poorly prepared; wrong fields; wrong persons trained.

That sampling of complaints was presented alphabetically to show the diversity within the basic consistency about one point, group instruction is not getting through very well to the actual job level. This failure is inherent in GROUP instruction, and especially in PRESERVICE or PRE-ASSIGNMENT instruction. A class is likely to be HETEROGENEOUS as regards the specific job duties which will follow the training. Instruction which is equally applicable to many assignments tends to be GENERAL principles, concepts, and understandings. That leaves the specific skills to on-the-job learning, which is likely to be haphazard or non-existent. More on that next.

5. Shortcomings of on-the-job training (OJT) for individuals. OJT has an even worse image than group instruction. Slips from so many kinds of work were so consistent that we will give samplings from one audience to represent them all. Forty-six administrators from high-level organizations wrote slips. In their work one employee mistake could be very serious, even catastrophic. Here are samples of those administrators' slips about OJT in their own organizations. Wordings are edited and shortened for easy reading.

a. *No OJT.* There isn't any OJT; sink or swim; no central plan for OJT; nobody assigned to do OJT; nobody to contact; nobody to correct what is done wrong; no feedback from superiors; people not corrected for what they do wrong; learning considered an employee responsibility.

b. *Too little OJT.* OJT not recognized as important; lack of interest in newcomers; role models for new people lacking; too little time allowed to catch on; little information comes down the ladder; independent functioning expected too soon; successes and failures not reinforced or corrected; second and third shifts need most help but get least.

c. *OJT needed.* Assigned but uncertain about what to do or how; preceptors or mentors for individuals needed but lacking; fear of failure causes stress; errors during trial and error practice can be serious.

d. *OJT hard to get.* People afraid to ask and be judged unqualified; uncertain about whom to ask for help; overconfident ones need help but don't seek it; weeks to get answers that are needed NOW.

e. *OJT hard to give.* Lack of qualified ones in charge; employees don't know how to help others; those who know most are too busy to help; doers are too busy to advise; technicians may be able to DO but not to EXPLAIN; supervisors can't give selves to subordinates; too busy to listen; can't coach others about what they only half-way know; ambiguity about what are best ways for tasks; afraid to take responsibility for answers; afraid to advise and be wrong; newest supervisors are on night shifts where newest employees begin.

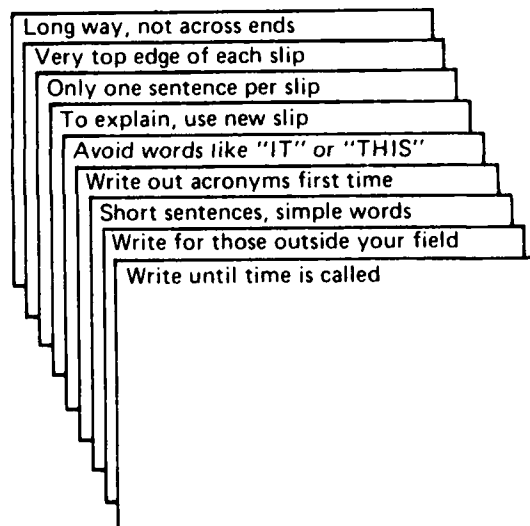
f. *OJT of poor quality.* Those who are asked don't know either; five answers to a question from five different people; inconsistent advice from the same person; wrong advice from overconfident ones.

The above assessment is a serious indictment of our whole economy and social order. Millions of employees are victims of the above kinds of neglect. Our national strength and our posture in the world are victims of the substandard performance of employees who deserve a better chance to learn their jobs. Please help us to get more of our nation's know-how into print and applied on the job.

6. Examples of needed publications. A 70-person workshop group of university people wrote slips on their next applied authorship hopes and plans. Here are a few titles selected from many they turned in. We challenge you to match them by equally APPLIED writings in your own field.

- a How to avoid bluelight hazards in dentistry
- b How to journalize a payroll
- c How to make flow diagrams for systems
- d How to organize parent groups
- e How to adjust to the menopause
- f How to do career counseling
- g How to negotiate with clients
- h How to improve clinical judgment making
- i How to manage software for a space vehicle

Our aim in this book is to stimulate and assist authorship and publication in similar applied fields. Once on paper, that kind of know-how can improve our economy and social order in a great many ways. We invite you to join in meeting that need.



Give clear instructions about slips

PART I. PRODUCTIVITY ANALYSIS

How to assess needs and find better ways

Productivity analysis is for productivity improvement. You analyze to improve. First, you spot the troubles, then find better ways. You look for deficiencies, imperfections, or sources of error in order to remedy them. Part I is on how to look.

CHAPTER 2. NEEDS HOW TO SPOT TROUBLES

1. Record your own insights first. If you are in an ongoing situation, you are aware of productivity obstacles you face. Put these on paper, one per slip. For details of how to do this, study carefully Chapter 2 of the Crawford - Demidovich book "Crawford Slip Method." It is published by the University of Southern California School of Public Administration. Order or buy it from University Bookstore, USC, Los Angeles, Ca 90089 - 0892, Tel. 213 - 743 - 2601. Chapter 2 is entitled, "MENTAL LOW GEAR: How to mobilize your own brainpower."

If you are well into a task, project, or program, you may put your troubles on slips, one after another, for an hour, possibly several. You may add others the next day. You can never hope to recall all these negatives at one sitting. Teasing a batch of them out of your brain one day can cause more to ripen overnight and come to mind the next morning. Carrying a batch of slips with you can help you to capture many that pop up at unexpected times. As you move about or deal with people, you may add to the batch. A "dear diary" slip writing period at the end of a day may add more. Ideas do not come to you in orderly fashion. Put them down whenever they come.

One of these troubles may remind you of others, or of "little troubles within big ones." Getting these on paper enables you to analyze each, one at a time, in ways you never could while worrying through a sleepless night. After you have a good pile of these trouble slips, you can classify them into several little piles. Then you may generate as many details about each little category of troubles as you could initially about your total situation. This elaboration of one little problem at a time enables you to PENETRATE into your situation far deeper than before. This is a bit like the military hospital X-ray, which can tell exactly where each piece of shrapnel is in a wounded soldier. And it is a RECORD to which you can return again and again, problem by problem, in your search for remedies. You get PERSPECTIVE, like seeing the woods instead of just trees.

Recording the little ones along with the big ones can give you a better sense of priorities when you come to organizing them. Finding a few "kittens" may help you to find the "mother cat." Finding her helps you to locate others in the litter.

If you are about to go into a new job, or to start some new project or mission, you can start writing slips on troubles you might EXPECT. Being a newcomer entitles you to ask questions and seek orientation. You can think of many questions you will need to ask when you arrive on the scene. Preparing the right questions can make you "look good." More important is their value in getting more of the answers you so badly need. You can catch on and take hold faster and better if you prepare your own agenda for your orientation. Thousands of our workshop slips tell us that an all-too-common kind of orientation is "Here's your desk; you're in charge." Those who otherwise would guide your first steps may be too busy to give you much help. You can beat that if you plan it yourself beforehand.

2. Don't trust your own analysis to be complete enough. However hard you try, you can never hope to spot and define ALL your troubles. Some of them come from you yourself. You may be making mistakes of which you are unaware, or unwilling to recognize. Other people may help you to see yourself as others see you. You can gain much realism, objectivity, and effectiveness if you can admit not knowing it all and will let others help you. Millions of employees wish for a safe way to "tell the boss a few things." And you don't have to be a boss to benefit from others' insights. Millions of employees would like to tell some of their colleagues a few things. The composite insights from many far exceeds what your viewpoint and memory can produce. The Crawford slip method can afford safer ways to use the brainpower of those above, alongside, or below you.

3. Get others' insights in writing. Oral mobilization of others' brainpower is entirely too slow, for both you and them. To make a needs assessment by interviews or conversations is like firefighting with water from a dripping faucet. It is tremendously expensive. One idea per minute is the best you can hope for. You probably talk half the time. Thus 30 ideas per hour is your top intake. You do well to get that many, because much time is needed to focus the other person's mind on the target. Two or more salaries are being paid for that time. Two weeks of your salary, and an equivalent in the others' salaries, might be only the INITIAL cost of a very limited needs survey by the interview method. Yet consultants often spend MONTHS "getting oriented with the company" that way. That is like filling a barrel with a spoon at \$1.00 per spoonful.

What really is said is hard to recall or remember right. Even if you tape record it, you face a lot of cost and trouble doing anything with the mass of words. There is an enormous amount of idle time or "junk talk" in such a taped record of a conversation. Did you ever try to edit and print recorded conversations or improvised speeches by important persons whose garbled sentences had to be "cleaned up a bit"?

4. Use a workshop method instead of interviews. The Crawford slip method norm is one slip per minute

PER PERSON in a whole audience. The Crawford slip method will produce one idea per minute PER PERSON from all in the audience. To get over 1000 ideas per hour is quite common. You can "interview" 30 or 50 or 500 simultaneously. You can target all minds sharply on the bull's-eye, to get rid of the "junk answers." You can get enough persons' answers to each question to reach "saturation," repetition, or a good consensus. You can get the composite know-how of different types of people, to merge into an INTERDISCIPLINARY composite.

A typical workshop of 90 minutes can get such saturation on about five well planned target questions. That cuts your own time cost to a minimum. Your workshop members will be compensated for their loss of production time through LEARNING BY ANALYZING the problems you target. Their slip writing can be extremely valuable self-education, just as your own mental low gear slip writing had been for you.

5. Run staff meetings as workshops. Our nation spends millions on meetings. Their cost in lost production time is in billions. Managers have them to "share ideas" and "improve operations." Their worth as reported on workshop slips which we have received by the thousands is very low. The oral trickle cuts their worth down greatly. Fear to speak keeps most members quiet. Most of the exchange is by a few assertive ones. These assertive few "stew in their own juice" and miss the insights of the more cautious many. How many new ideas did you get expressed at your last staff meeting?

If you really want inputs, start by posing your problem. Explain what your "trouble-of-the-moment" is. Ask each to "DISSECT" that trouble into its specifics. Ask each to write slips INDEPENDENTLY, without knowing what others think. Get these slips written before oral discussion so the views of assertive people do not bias the ideas of others. In that way you can get inputs from many more vantage points in the organization. And you can get them all in a very few minutes of meeting time. If there are several hot spots that week, take them up one at a time. Five minutes of targeting and five of writing slips can give you far more return than ten minutes of typical talking.

When you ask for troubles, about half of the slips may be remedies instead. These will be equally helpful as they are the flip-side of the same coin. Some slips identify troubles, others remedies, but all are giving you some good INSIGHTS into the problem for which you called the meeting. The language format is not a critical factor. Even if targeted for separately, we usually classify troubles and remedies together when making a basic diagnosis.

6. Seek inputs from a cross-section of your organization. Typical meetings include a small number of key leaders or managers. In a sense they may be an "elite" group. They tend to coalesce around certain views or policies held by those of high rank or assertiveness. Call this INBREEDING if you like. Such an

inbred group has the same limitations as the individual manager in possessing too few answers to the questions. They, like the individual leader, can benefit from inputs by the rank and file.

You don't need to ask every person in the company for slips. The law of diminishing returns applies. The principle of SAMPLING can get you a good saturation at less cost. A cross-section of different know-how types can alert you to factors as seen from many vantage points. Interdisciplinary representation enriches the composite. For an initial diagnosis such a cross-section of 30 persons is more cost effective than one of 300. Larger numbers may become involved later in the search for REMEDIES, after the diagnosis gives you a stable list of troubles.

7. Seek inputs from interacting parties. Even your organizational cross-section may lack some insights which some outsiders could give you. Those with whom you interact can fill in many of your blind spots. Customers can tell your sales persons and marketers a few things about your products or services. Patients could tell doctors and hospitals some useful things. Your suppliers see your business from a very different perspective than yours. Your bankers and insurers might open your eyes to many dangers or opportunities. These all have good reasons to wish you to succeed because they benefit from your success. They are not adversaries chasing you like hungry wolves. They might attend a workshop and WRITE some needed advice which they might not give orally, even if you had the time to listen. A workshop enables you to learn vastly more, at less cost in their time and yours.

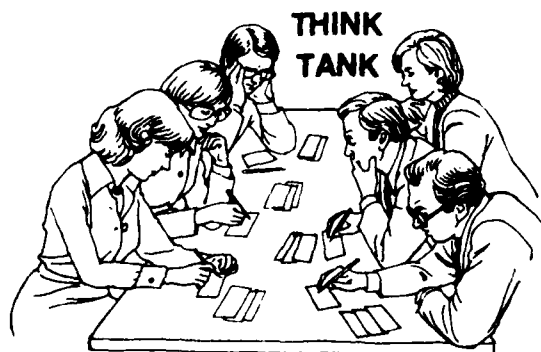
8. Get inputs from societies and associations. Some of your troubles plague many other similar organizations. Dedicated professionals or key persons may gather once a month to bemoan their fate and seek relief from what hurts most. Such meetings need fine and stimulating speakers. A workshop of the type we have described might be just the change of pace the program chairman is wishing for. If you can give such a workshop, process the slips, and prepare a good feedback report, you might get a second program spot a few months later to present it. Even if not, the slips can be a rich treasure for your own use in your own organizations. Like your staff meetings and other workshops, the association members can give you good insights about REMEDIES as well as troubles. Your enlarged perspective may add to your status in the profession itself, not just to the prosperity of your own enterprise.

9. Preserve anonymity and privacy of slips if possible. Slips about deficiencies may imply CRITICISM of something or someone. People responsible could well be unhappy. Not everyone can take criticism gratefully, however badly they need it. This could reduce analytical efforts, even on slips. The fear that the boss may be displeased can shut off much input. Fear that his or her boss may have a still different reaction adds uncertainty. Dead silence in meetings, or speaking in safely vague

ambiguities, can be explained by the fear of displeasing someone. This same fear may cause written memos, or even workshop slips, to be "vaguely safe," even if unsigned. Fear that handwriting might be recognized may check the flow.

For some especially sensitive problems it may be best to get the slip processing done by a qualified outsider. Perhaps a staff analyst might receive and process the slips. After they are classified into meaningful categories, they might be TYPEWRITTEN so nobody knows who wrote which ones. Or KEY WORDS can be written on new slips instead of the more wordy sentences so their new slips may be made more generally available.

Sometimes the slips are needed now, and decisions based on them are needed NOW. In such cases all should know that anonymity and handwriting privacy will be waived. The INDEPENDENCE factor will still be preserved. A staff meeting of 21 persons might write slips, shuffle them, and form seven separate "buzz groups" of three people each to form advice in light of the added penetration into the problem specifics. The procedure writing workshops which will be explained in a later chapter definitely require such open use of slips. If you can't have full privacy of slips, do preserve their INDEPENDENCE.



BRAINPOWER MOBILIZATION

CHAPTER 3. BETTER WAYS HOW TO FIND REMEDIES

Diagnosis is a giant step toward treatment. Identifying troubles points the way to remedies. Intensive analysis of problems adds precision to solutions. Following are some thoughts on how to assemble remedial know-how.

1. Sources of remedial suggestions. The same workshop audiences you use for diagnosis are helpful for remedial ideas. In fact, they give remedies along with troubles from the very start. Reread Chapter 2 for a review of audiences needed. One major difference is that you may want MORE PEOPLE for remedies. Also you may need to reach a higher level of expertise than you used for the diagnosis. The reasons will be explained shortly.

2. Level of expertise for remedies. Pooling ignorance is not the best way to get wisdom about remedies. You reach for expertise wherever you can find it. Use your specialized experts for all they are worth. But if those in charge knew all the remedies, why do you still have troubles? Rank and file people are experts about some remedies that the higher level generalists overlook. They may fill in some blind spots. If some of their slips prove to be wrong, they can easily be ignored. Their slips are SUGGESTIONS, not BALLOTS. There is no point in trying to be REPRESENTATIVE as in an election.

3. Safeguarding quality of remedial inputs. The same factors of anonymity and independence that are needed for troubles are needed for remedies, and for the same reasons. One difference emerges, as regards degree of emphasis on anonymity and privacy of handwriting. The "social climate" may improve after the troubles are identified and brought out into the open. Fear may be reduced when people see that the bosses are truly open and interested and listening. After it becomes clear that the improvement program is truly a joint effort, people may be allowed to handle each others' slips as they would trade ideas orally.

We caution about over-optimism or undue haste in assuming this to be true. Managers tend to think it is already true. Employees tend to pretend not being afraid, but play safe anyway. If you do abandon privacy of handwriting, by all means let that be known before the slips are written.

The other quality safeguard is INDEPENDENCE. Have them write before they talk. Get the slips written BEFORE the targets are discussed in a meeting. Talking can be much more fruitful after each has independently formulated some ideas worth saying. And you will have the slips to enrich the composite.

4. Analysis by subtargets. People can often give you as many ideas on one subproblem as they did originally on the main problem. It is common to run out of ideas after "thinking 10 ideas deep" into it. Your diagnostic workshops tend to be 10-ideas-deep analyses.

For remedies you may need to go 100-deep or better. You do this by classifying your 10-deep slips and presenting the categories as subtargets. A person in a workshop writes 10-deep on one subtarget at a time.

5. Rotation workshop procedures. If you have 20 subtargets, you will need to divide your audience so each covers some while others analyze others. When an audience is to write slips on numerous subtargets, we advise use of the ROTATION plan. Duplicate the list of subtargets, numbered 1, 2, 3, etc. Instruct all to CODE each slip to match its number in the list. Do the targeting for this first one ORALLY before you distribute the printed list. Have all write on the first one, to establish the CODING idea and format. Then COUNT OFF around the room for STARTING numbers. Have each try to write ten slips on that starting number, coding each to match it. On slow down they then write on the next larger number, coding each slip to match. If they finish the last subtarget, they return to number 2 (No. 1 already covered by all).

By this means you soon have two or more persons covering a given subtarget as they begin to overlap each other.

6. Saturation levels. Degree of saturation is affected by how many write on a target. Your 10-deep diagnostic workshops may yield saturation, or degree of repetition, on the GENERALITY level but not get down to the SPECIFICS required for precise remedial measures. It does not help much if the consensus stops on such generalities as "inefficient" or "too costly." You need the specific details about the inefficiencies or leaks and losses that run up costs. The subtargets for the 100-deep level of analysis can reach into that deeper layer of specific know-how. But when you have 20 subtargets and only 20 in the audience, you will have very few people writing on any one subtarget. That calls for bigger audiences, or more workshop sessions, or much LONGER writing times. If necessary, the same people may write slips on several days, if these are the only ones who are knowledgeable about the problem.

7. Use of library sources. For some problems you may find library materials very useful. There are several ways your use of these can be greatly improved by the Crawford slip method. The first is by taking your notes on slips from the very beginning. Write one sentence per slip. Write these with such care and precision that if you need to quote you can. Preferably write them in your own words so you don't need to quote or get permissions.

CODE your sources by numbering them 1, 2, 3, etc., in the order you read them. Add to your master list as you read more books or articles. Make this master list with great care so you can trust it for any footnotes you may need later on. Then code each slip as you take notes. At the end of each sentence (each slip) write that code number, followed by the PAGE from which it came. If you ever do need to cite a source, your master list of code-numbered references can supply all the

specifics you need for a footnote or bibliography.

You can even put a trained crew of assistants to work in a library search if necessary. Teach them well about precision in making their coded master lists. Teach them well regarding the kind of information you want them to assemble. Teach them how to skip and skim and select what is pertinent. Will Durant married Ariel when she was just a teenager. He put her to work copying quotations from the library for his philosophy books. She put each quotation on a separate card according to Will's established format. She became a co-author in later volumes of that magnificent series.

8. Decision responsibility. Remedial suggestions are RAW MATERIAL for decision making. Each person's suggestions are efforts to influence decisions. But it should be made clear that they are not VOTES, and carry no legislative authority. Collection of remedial know-how is not abdicating management control. Many slips may be self-serving wishes of the "gimme-gimme" type. What if they are? It may be well to know what the wish lists contain, even if not all wishes can be granted. We advise putting workshops on a higher MISSION level, and not a labor relations one. Decisions can be better made after all the inputs are in and organized into a meaningful configuration. They can then be made by the persons who are responsible for implementing them.

9. Objective research. We do not recommend basing all decisions on remedial suggestions that come in on slips. Some decisions concern questions for which NOBODY knows the answers. Some things require FACTS, not mere opinions, even when there is almost total agreement. Fifty million Frenchmen (or Americans) CAN be wrong, and often are. That is why we spend billions on scientific research.

Even when objective data may not be available, you might improve subjective thinking by the THINK TANK principle. The Crawford slip method is one such aid to subjective thinking and planning. It is not offered as a one-and-only cure-all.

10. Roles for analysts. For the Crawford slip method to render its full potential there is need for a central nucleus of analysts for a think tank network. This should be an ongoing and permanent unit in charge of well qualified research and editorial people. They could be a clearing house for a network of geographically dispersed authors, educators, planners, and managers. They could assist in designing targets for workshops, and in processing and publishing results. Once established and proven, this group could do or direct or assist special studies under grants or contracts, as the Rand Corporation does. We recommend establishing such a think tank. Keep it in mind as you read on in this book.

CHAPTER 4. CLASSIFICATION

HOW TO ORGANIZE SLIP INPUTS

A miscellany is hard to grasp or manage. A few thousand slips can be a mass of confusion until you classify them. They are very RAW raw material. Refinement begins with organizing them. That can convert them into training materials, procedure guides, project plans, or management decisions. This processing of the miscellany is the part of the Crawford slip method that presents the greatest professional challenge. It is not a task to assign to a clerk. Some thoughts on how to start learning to do it follow.

1. Form kindred piles. Before classifying a bunch of slips, read them all for an overview or perspective. Then start putting together slips that have kindred thoughts. Here is a brief synopsis of the mechanics of slip sorting. Please read Chapter 4 of the Crawford-Demidovich book for more on the classification process.

Work on a LARGE table. Get one that is free from drafts and does not need to be cleared for other uses. Lay slips face up until a few kindred ones show up. Write a key word or index term on a "CLASSIFICATION CARD" for each pile as it develops. Lay slips on each card so this index term is not covered up. Position piles alphabetically with A,B,C index terms at your far left, X,Y,Z ones at your far right. Arrange these in rows, with A's starting at table edge and going forward from you. The M's will form a row right in front of you, running from MA to MU or MY as far as you can reach. If one spot gets crowded, shift piles as needed. You can still find categories by their index terms.

2. Choose action categories. Kinship of ideas may exist in more than one dimension. THING categories will be less useful than ACTION ones. You could not live in a house where all chairs were in one room, all tables in another. You group furniture for its USE COMBINATIONS, as for dining or for sleeping. That same concept applies in grouping ideas about improving your ongoing activity or operation. You would not learn carpentry very well from chapters on the saw, hammer, and chisel. Much of the learning concerns how to RELATE the things to each other and to the intended results.

3. Choose DIFFICULTY categories in action patterns. Even more important than the action concept is the one of difficulty or trouble within the activities. Make these your categories. Many troubles arise from the interrelations between actions, just as dining involves many things and actions. Many job actions may never cause trouble, and will draw no slips. Focus on those that do. The piles of trouble slips will reveal priorities for improvement efforts as seen by your workshop people. Individual slips in each pile will spell out possible options for improvement.

4. Try for about 20 to 60 categories. Think of each pile as a possible chapter, or section within a chapter, as if writing a book or training manual. Until all slips are

sorted, you can't be sure about exact outline levels. If you tried to sort on a PARAGRAPH level, you would need too many table tops. If you sort into only five or six categories, your piles will lose their distinctive and unique character. The middle range of 20 to 60 is about all you can manage within reach of hand and eye. It may also be about as many as your memory span and conceptual powers can manage. A typical book or manual is likely to have about 20 chapters or less. Many of your categories will prove to be SECTIONS and to combine within chapters.

5. Classify your categories into supercategories. After all slips are in piles, you will have a far better perspective than when you started. So start thinking about sequences and kinships between piles. Think how another person can best understand what is before you on your table. What piles are parallel to each other or subordinate to others? Which are major and which are in supporting roles within the whole?

This arranging and rearranging of piles into a professionally respectable outline configuration is an intellectual challenge of the highest order. It is truly the most crucial and demanding aspect of the Crawford slip method. It tests your professional vision or "statesmanship." In some ways it resembles the task of a president or prime minister in putting together a cabinet and its supporting bureaucracy. And, like a cabinet, what you put together should actually WORK. It should be the basis for an improvement program that actually IMPROVES.

6. Give double titles to your chapter and section piles. Each chapter or section needs a handy label to distinguish it from others. A noun or short descriptive term serves that purpose well. But these short noun titles leave much unsaid about the ACTION or TROUBLE involved. A more explicit verb is needed to reveal what action you are going to direct. Readers then get your meaning in two ways which support and reinforce each other. It becomes unnecessary to read the paragraph to understand what the noun title means. Chapter titles in this book illustrate that double title concept.

Try to avoid repeating the same main word in both the noun title and the action subtitle. For example, don't say "EVALUATION: How to do evaluation:". At least change the second one to "appraise" or "rate" or some equivalent variation. A thesaurus at your desk can serve well for this need.

Writing these titles and subtitles is usually easier to do after, or in the latter stages of, the classifying of categories into the final outline. The whole outline needs to flow in a smooth sequence. Categories that are parallel should be worded to reveal the parallelism. Your table of contents resembles a road map in some ways. Although it is a small scale model of your whole message, it should portray the wholeness and configuration clearly and convincingly. Do your best to make it do so.

7. A case example of slip collection and organization. The chief of the city arson bureau and his thirty investigators wrote slips to improve arson investigation. Their first workshop was a troubles-and-remedies diagnosis on the 10-ideas-deep level of penetration. They wrote on several targets, one after the other. Their last target was to write about 10 or 15 CHAPTER TITLES for the arson investigation manual they wanted developed. These were asked for in explicit HOW TO language.

Hundreds of HOW TO slips came in. Some eventually became chapter titles, others sections within chapters. The table of contents took form from these HOW TO slips. There were ten main chapters. Into these went all trouble slips and remedy slips, along with the HOW TO versions of these.

Content for those ten chapters was still needed on a more specific level. All 31 persons met again for a ROTATION workshop to get the 100-ideas-deep specifics of remedial know-how. With 31 people and 10 chapter subtargets we had three STARTING on each chapter. As they reached slowdown and moved to the next higher chapter number, we had six writers per target. Soon there were nine per target, and so on. By writing for two hours, we got an excellent saturation. We felt ready to put it all together into the arson textbook.

For writing chapters and sections, the classification went on the same way as for forming the table of contents. The only difference was in the level of detail. The book was published and used for years at USC by the chief of the city arson bureau. It was used in many other places. It was printed and reprinted many times.

8. What next after classification? Whether your slips are for a manual or project plan, the same kind of grouping under HOW TO categories can be helpful. Whether you are called an instructor or not, you become one anyway. The composite know-how which you have collected and organized makes you a very valuable person. Your role as counselor, advisor, or leader of others is enhanced. The added perspective from that know-how configuration and all the specifics that interrelate within it become a major resource for others. Later chapters will spell out some ways to put that resource to good use through those you influence.



PART II. APPLIED INSTRUCTION

How to direct learning of tasks

Our workshop slips by the thousands indicate that existing job know-how is not getting through well to those who need it. Whether you are an instructor, a writer of training materials, or a productivity improver in some other role, you have an INSTRUCTIONAL role. You may direct, supervise, counsel, or instruct a GROUP, or individually. Either way you INSTRUCT. How well do you succeed?

What success factors must you include? Room temperature or lack of a microphone or shortages of money for duplication of materials may defeat you. But having all these kinds of support cannot guarantee you success. You succeed or fail mainly by the over-all DESIGN for the teaching-and-learning act. That is what Part II is about. First will be the over-all design, then guidelines for its four main components.

CHAPTER 5. OVER-ALL DESIGN

HOW TO TEACH SO LEARNERS CAN PERFORM

1. Teach how to do the task. What your learner learns should show up in what is done about it. Your goal is productive action on the job. Insights, understandings, and guiding principles dangle in air until they are APPLIED. Make your instruction TASK centered instead of KNOWLEDGE centered. Knowledge is a MEANS. Task performance is the end.

2. Give your lesson a TASK title. Identify clearly and unmistakably the task you are to teach. This may be to make a specific metal part, or just to bore a hole in it. It may be a very simple act or a more complex one. If very complex, you may be about to teach SEVERAL tasks at once and fail at all. Whatever it is, NAME it so you can talk or write about it.

Make your task titles technically correct. In a factory there may be thousands of parts to make, and thousands of tasks in making them. If yours has a parts number or technical task name, use it. Much of your teaching may have no such established task names. You may be responsible for many one-of-a-kind actions or procedures which NOBODY has named or taught before. Many are TRANSACTIONS or INTERACTIONS that are specific for your own company or organization's products and services. This is especially true in the work of managers and other professionals who function at the edge of the "nobody knows" zone. Much of this book is aimed at this higher level of learning. Even so, examples from the simpler tasks can help to guide you in the more complex ones.

We recommend double titles for your lesson plans. A noun or short descriptive title gives a handy over-all identification. A longer but more specific HOW TO subtitle can make the meaning more explicit. The two reinforce each other. Even so, the title is only a

directional sign on the road to learning. You will need to escort the learner step by step along the way.

3. Imitate World War II JOB INSTRUCTOR TRAINING (JIT). Millions learned new wartime tasks under the federal government's JIT plan. First line supervisors got 40 hours of training as instructors of the individual workers they supervised. They wrote a one-page lesson sheet for each task their people had to learn. They wrote the task title across the top of a sheet. They listed the steps in doing it down the left half. Opposite each step were any "key points" or special cautions for doing it right.

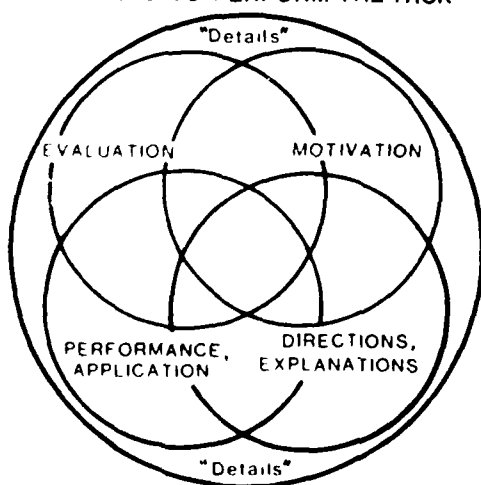
Learners came one or two at a time as hired. The sheets were put in learners' hands. They became the basis for much self-instruction, and for the supervisor's one-to-one coaching as they worked. The 40 hour course had taught the making of the lesson sheets, plus the way to do the coaching.

That was the system the federal government used to put millions to work. Crawford learned it and used it in writing a production control manual for the Douglas Aircraft Company's dive bomber assembly line. It served well in the emergency. After the war it was soon forgotten. Almost nobody now knows it ever existed.

4. Include motivation, directions, performance, and evaluation. The JIT coaching had four phases which were printed on a small card the size of a business card. The four parts of the recipe were: a) Motivation. b) Presentation of directions. c) Trial performance. d) Evaluation. Our next four chapters will go into particulars of these four phases.

The four are NOT STEPS to be done and completed in a rigid sequence. they are more like four interlocking circles inside one big PERFORMANCE circle. Doing one may assist others. You may switch back to motivation after a trial has failed and the learner is discouraged. The four sides of a livestock corral are needed to keep the animals in. But they do not follow one after another in doing it. The important point is that you have all four, whether for a corral or a lesson.

LEARNING TO PERFORM THE TASK



CHAPTER 6. MOTIVATION

HOW TO CREATE A WISH TO LEARN THE TASK

"A learner taught without a will may remain in ignorance still. You are a salesperson as well as a teacher. You sell your over-all mission. You sell each task, and perhaps each STEP within that task. Why should a learner try to do better some task that seems pointless or meaningless?

If people sleep in your classroom or work place, did you put them to sleep? Can you wake them up? Learning, like work, comes from WANTING TO. Adrenalin flows and energy rises when they see something worth studying or working for. They may start with high hopes and good will and a wish to be productive. Continued motivation may depend on you. This chapter suggests some ways to build or improve it.

1. Don't be misled by a few self-starters. The self-motivated ones have already learned some things you need to teach to the others. They have already glimpsed the rewards or pay-offs of good work. You have inherited some good learners from some previous teacher, or from their being exceptionally bright. Their being achievers already should not blind you to the needs of the others. Don't expect all to respond as well as these gifted few.

2. Don't rely on artificial incentives as your main resource. Marks, grades, and credits can't compete with clear visions of what is worth studying for. Nor can money alone motivate productive work on the job. The more artificial the incentive, the greater is the temptation to cheat. Your classroom or work place becomes a room full of counterfeit learners or workers. You become a counterfeit instructor, selling counterfeit know-how and getting counterfeit productivity. There are better ways to sell, as following paragraphs will explain.

3. Sell the over-all mission. The worth of the specific task or lesson depends on the worth of the mission of which it is a part. Selling the whole helps you to sell its parts. Loyalty and commitment to your company can carry over into your department or office within it. How well it does may depend on how well you link the two. The whole is greater than the sum of its parts, if you can connect them all into a coherent mission. People need to see the worth of the mission, and how important their part is to its success. This is well exemplified by the poem about how lack of one horse-shoe nail caused loss of the horse, rider, message, battle, and kingdom.

4. Sell each specific task and lesson. The man who shod that horse was not thinking of the kingdom and how it depended on that nail he left out. He might have been thinking about how to get home to supper a minute sooner. Many people think small. They are concerned with what is closer and more immediate than kingdoms or America's competitiveness in international markets. Many people are very "thing minded." You

need to sell the little things to them as they go along. You can't rely on commitment to the total mission to do all the motivation for those people. Match motivation efforts to the specific tasks you want learned. Eisenhower's task was to get victory in Europe, Patton's to cross the Rhine, Sergeant York's concerned a certain machine gun nest.

5. Sell on the basis of WANTS. Selling is the art of want satisfaction. Match benefit promises to what your learners want. People vary greatly in what they want. To sell a car you might stress fuel economy with the husband and the beauty of design with the wife. Each task you try to get learned may have to be sold to different learners in relation to comparable differences in wants.

6. Sell precision and productivity in the task. A task is worth DOING, but also worth doing WELL and EFFICIENTLY. The learner who gets a good result but too slowly or with too much material has more to learn. Precision of product should be matched by refinement of process. A small improvement in either might make a big difference in the mission. A small increase in a baseball batting average can move a player from a minor league to a major one. That last bit of productivity is worth striving for.

7. Sell on the basis of BENEFITS. The word BENEFITS is much used in the sales and marketing world. "What's in it for me" is much on the customer's mind. Your role is to answer that question clearly and vividly. There must not only BE a pay-off for the learning, but the learner must realize it and believe it will come. A can of peaches has a color picture on the wrapper, to make your mouth water. Can you portray the benefits which your lessons have with an equivalent clarity?

8. Don't overlook ALTRUISTIC wants, or benefits to OTHERS. There is a vast amount of altruism in people. A mother may risk her life to save her child from a fire. Those we love become extensions of ourselves. People who are very selfish about some things may be very generous about others. The "what's-in-it-for-me" question really is broader than that. It is "what's-in-it-for-me AND those for whom I am deeply CONCERNED?" The "greater good for the greatest number" really does appeal to some who are well worth cultivating. They may do more with what they learn from you because of their greater sense of responsibility.

9. Sell on the basis of IMMEDIATE or NEAR-TERM benefits. Salaries, promotions, peace on earth, and hope of Heaven may actually be improved by learning a certain task. But they may be so far ahead that they don't make much adrenalin flow. Benefits that can be gained SOON have more appeal. Someone said incentives' appeal is inversely proportional to the SQUARE of the time delay in receiving them.

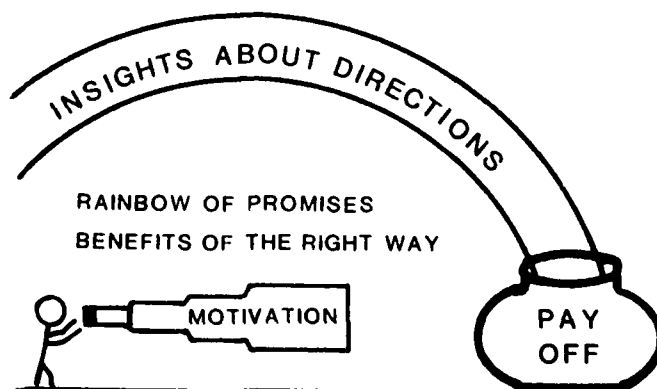
10. Sell on both hope of pleasure and avoidance of pain. Risks and dangers are "negative benefits" that are well worth using. In fact they are often more dramatic, vivid, and compelling than the positive ones. The unpleasant effects or increased costs of tasks wrongly

done may be easier to portray than the more prosaic effects of doing them right. People want maximum pleasure and minimum pain. Of the two the pain avoidance may often be the more powerful motive.

11. Write down your selling points. A written LIST of benefits can greatly improve your selling, even if you sell orally one to one. It is like a restaurant menu, from which you can choose to match your learners. Support each benefit by REASONS for expecting it. A mere naming of it may have little impact. You need "sales talk" to bring it alive. The goal is to persuade, convince, and inspire. Mere assertions may not be very convincing. If you are teaching several tasks, such a written "benefit inventory" for them all may well be prepared as one unified editorial project. That can add continuity, progression, and linkage to the over-all mission.

12. A case example. A 20-person seminar for city building officials wrote a book to train building inspectors. Their diagnostic slips produced the table of contents, in HOW TO format. Chapters were on such tasks as: a) How to inspect for zoning requirements. b) How to inspect excavations. c) How to inspect framing, etc. Each chapter was composed of SECTIONS, each with a HOW TO title for a sub-task. Their rotation workshop slips yielded the paragraph content. Another rotation workshop was then run specifically for the BENEFITS to expect from studying each chapter. These selling points were put into opening paragraphs at the beginnings of chapters or of specific sections within these.

The seminar members did the slip collection, classifying, and first editing during the three-week seminar. More precise editing was done later by the editor-in-chief of publications of the association. She was one of the 20, hence well involved throughout. The book was published in hard covers for nationwide use in many cities. The project illustrates the potential in recording and recycling the know-how of the experts in any profession or line of work.



CHAPTER 7. DIRECTIONS AND EXPLANATIONS HOW TO IMPART INSIGHTS TO GUIDE ACTIONS

Those wartime supervisors directed about 10 workers each. Most workers began from a cold start, dead zero know-how about their new duties. The supervisors had to teach and direct them, and get parts made right by them. Their JIT (Job Instructor Training) course was 40 hours long. They learned how to prepare the lesson sheets for the tasks they were to teach and direct. Those lesson sheets had three features: a) Task TITLE across the top. b) Task STEPS down the left half of the sheet. c) Task KEY POINTS about steps down the right half. That format, or some adaptation of it, is sound in principle as a way to impart your own job insights. Productivity suffers badly for lack of directions. Thousands of our workshop slips tell us that many people don't know what to do or how. This chapter deals with that lack.

1. Break tasks down to steps. Line up your directions so it is clear what comes first and then next. Until you do, your learner confronts a miscellany. One step at a time is easier to grasp than a jumble of unorganized facts and cautions. A numbered list of steps is far easier to grasp than a running stream, whether spoken or in a paragraph. Until you can make such a list of steps, you are not fully ready to teach the task.

Word these in the imperative mood. That improves the ACTION focus. Be free to tell what NOT to do. That may carry more weight than affirmative directions. The words BEWARE or AVOID have some helpful dynamic qualities.

2. Give REASONS for steps. Each what-to-do naturally calls for a why-do-it, or a why-do-it-that-way. Otherwise the learner is flying blind. The rationale for the steps aids catching on. The key points should be made clear. These may be complex. They may require factual data or theoretical principles as back-ups.

Such informational support is better given AFTER a direction is given, not BEFORE. A common error is to give this as a foundational build-up. But at that time the learner is not ready to receive it. Much of it is lost in empty air. The best sequence is "Do it this way, BECAUSE."

Two exceptions to the step-by-step instruction deserves mention. One is that some tasks can be done in a variety of sequences so long as all the actions are taken. Your directions may include all those actions but not specify a fixed sequence for doing them.

Another exception is that some tasks may require on-the-spot judgments that can't be made in advance by you. Sometimes you need to alert learners to options and factors involved in these. Not all work can be done by cookbook recipes. Go as far as you can toward realistic guidance. The "job enrichment" concept will have been overdone if you give less help than you can give with certainty. Feedback from your students will help you to judge how well you are communicating.

3. Make it simple. Give directions in learner language. Technical jargon goes over the heads of beginners. Big words and long sentences go by them. More words or longer words make it harder to understand. Professors and scientists may impress each other with complex discourse, but your learners will respond better to simplicity.

4. Be concrete. Demonstrate the steps if you can. Talk them through as you do them. The goal is not just to show them but to focus on the KEY POINTS for doing them right. Objects, pictures, films, videotapes, etc., all involve this same principle of SELECTIVE observation. Line drawings may be better than photos because they can leave out irrelevant detail. Blackboard lines may be equally selective.

Don't overlook the value of image bearing WORDS. Examples are like windows, to let the light into your lesson. Verbal examples may cost less and teach more if well selected. An anecdote, especially a well chosen humorous one, may clinch a point better than any photo you can find.

5. Prepare your directions on slips. Write each step on a separate slip. Do the same for each supporting informational statement. Having your directions and major points on slips allows rapid adjusting of their order. You can't think of them in correct sequence on a page. You would soon bog down with rewriting of your pages. Paper clips can keep your clusters separated. Rubber bands can segregate groups of clusters. You can open up any banded bunch or clipped cluster and revise or rearrange it with ease.

6. Structure your directions in OUTLINE form. A numbered LIST is easier to grasp and follow than a running paragraph, as a way to present steps or reasons. When teaching complex tasks you have many such lists. Outline symbols and line indentations help you to keep lists separated and also to make their relationships to each other clear. Paragraphs let you get by with a little less precision of thought. The result is a little less effective teaching.

7. Develop a SYSTEM. A consistent system for your teaching notes and your teaching performance will make life better for you and learning easier for those you teach. Parallelism of formats lets one learning carry over to others like it. Standardizing what repeats can release time and energy for one-of-a-kind learnings. One good way to treat many subjects beats making each a separate case. Classification into subsystems enables you and your learners to penetrate and master many more tasks and interactions.

8. Dare to lecture, but do it well. Lecturing has a bad image. So do training manuals that describe or inform but do not direct. Telling by one who knows beats classroom arguments among those who don't. What we have said about the make-up of your directions applies to what you SAY as well as to what you WRITE. If you write good directions of the step-by-step kind, with supporting reasons and back-up information, you have

some fine lecture notes. Learners will listen and learn from that kind of lecturing. Especially helpful are any accompanying demonstrations, visuals, blackboard drawings, or well chosen anecdotes.

9. Rely less on discussions to present new content.

A classroom discussion or committee meeting is a poor way to plan a complex document or operational plan. It is better for spotting flaws in one drafted carefully by a qualified person. The outlines which you draft and put in all hands may well bring out some thoughtful reactions and questions. Such discussions after careful study of what you wrote may be very useful. Questions to you from your learners will alert you to what is not clear, or what may be wrong. You can even assign the writing of QUESTION SLIPS about what you have presented. Similar discussions of presentations made by other learners to the group can be valuable.

If your idea is to have all "share know-how" by discussions, we recommend a better way. Present the target about which you wish them to share. Have each write slips about it. Collect and shuffle these well. Read one after another to give all a cross-section view of what others think. You can share infinitely more that way in far less time. Also, you have the slips on hand for making a composite that is far better than a discussion can provide.

10. Publish your directions. The precision of thought we have recommended goes a long way toward putting your directions on paper for your learners. The intention to do so can motivate you to prepare more carefully for what you will do orally. What you print can reach more people and "enlarge your classroom" geographically. This is especially true if your specialty is one that concerns many people in many places.

Even when you are teaching what is strictly local or unique, you can still "publish" on a small scale. Distributing copies to six people in your office or work center may make a big difference in productivity. Even one copy posted near a desk or work bench may produce improvements. Publication is not limited to best sellers and large editions.

11. Emphasize and assist self-instruction. Your best teaching can be by making self-instruction possible. Publishing your outline of directions is a good way to do that. Reading is faster than speaking. Also it is more flexible. Learners can read and reread what you write. They can't do that about what you say. They can't remember what they heard. If all your instruction is oral, you are a bottleneck. Their notetaking can capture only a fraction, and that with doubtful accuracy. If what you say is worth hearing, put it on paper. A copy machine can do far more than hasty notetaking can. Punching for three-ring notebooks can prolong learning opportunities.

12. Teach as a catalyst for your learners' mutual instruction. In-service learners already know much about their tasks, even if that is still not good enough. You can't hope to know enough to be an encyclopedia

of expert answers to all their questions. You can, however, help them to assemble, organize, and evaluate their existing insights. You need not pretend expertise in their roles. You can be an expert in the capture, recording, organizing, and listing of their know-how.

The Crawford slip method enables you to get those insights out of heads and on paper, one sentence per slip. By waiving anonymity but preserving independence of inputs you preserve freedom for them to classify and process their composite know-how. Thus they teach each other, with you as a FACILITATOR instead of a source of all wisdom. Try it.

This has been done enough times and in enough occupational specialties that we know it can work. But it is a high-technology process. You need to learn more about how to use the Crawford slip method, and how to APPLY it for such instruction. The following chapters can meet some of those needs. Even after those chapters you will need much practice to become comfortable with "doing it by slips."

THINK TANKING TO IMPROVE PRODUCTIVITY (WW II JIT FORMAT)

STEPS	KEY POINTS
1 Diagnose the activity	Slips on troubles, remedies
2 Penetrate into specifics	Slips on subproblems
3 Organize the composite	Classification, configuration
4 Design implementation	Manuals, procedures, plans
5 Apply implementation	Publication, instruction, supervision, management
6 Diagnose and refine the new situation	Upward spiral, same sequence

STANDARDIZING PERFORMANCE OF TROUBLESOME TASKS OR INTERACTIONS (Task title)	
NOTE: Below are directions for procedure writing, done in a format used in the World War II JOB INSTRUCTOR TRAINING program (JIT). This format was used to train millions for specific wartime tasks. Millions of sheets like this were printed, mimeographed, hectographed, even handwritten, to put new people to work. Entries here are in terms of procedure writing by the Crawford slip method	
TASK STEPS	KEY POINTS
1 Identify troublesome tasks	Each person writes task title slips for over-all task lists
2 Write first drafts of procedures	Each writes and SIGNS directions for tasks in own areas of expertise
3 Get drafts improved	Pairs confer, discuss, and agree on both steps and wording
4 Get drafts signed	Each improver signs after agreement with previous signers
5 Get drafts adopted	Include among improvers persons with authority to approve and adopt
6 Get signed drafts checked	Edit for English technology, legality, security, public relations, etc
7 Make procedures known	Print, publish, or post where they can be followed
8 Train for understanding and application of procedures	Use self-instruction on-the-job training, or classes
9 Get compliance	Apply controls, discipline, or enforcement as needed

CHAPTER 8. TRIAL PERFORMANCE HOW TO MANAGE THE LEARNING BY DOING

Insights must be translated into actions, thoughts into deeds. Otherwise, they don't stick, or don't render much service. "Use it or lose it" applies to a new learning. A daylong stream of words may leave people little more capable than before. Following are some guidelines for this phase of learning.

1. Apply as promptly as possible. The sooner new insights are used, the better are the results. Their shelf life may be short. They don't last long lying dormant. Apply before they are forgotten. It is easy to file and forget. The ideal way is concurrent learning and using. *In-service classes make this much easier.* People who take evening classes about tasks they perform in daytime have an advantage. Those who have an immediate supervisor who also instructs are doubly blessed.

2. Apply experimentally, not by mere repetitions. Repeating an act over and over to "wear grooves in the brain" is not psychologically sound. Thoughtful experimenting is what makes the most headway. The learner tries to do it right, preferably after being told and shown how. The first trial may not succeed. The second can be modified in an effort to do it better. Improvement comes from the brain work that goes with these experimental efforts. Sometimes mastery comes with a "flash of insight." While the act may be physical, the learning of it is intellectual. You as the instructor may make it more so.

3. Provide feedback on successes and failures. As an instructor you can speed learning tremendously by coaching in the initial stages of trial performance. You can spot mistakes which the learner can't. You can single out the GOOD parts of the act and confirm them so they continue. Such coaching is far more productive than letting trial and error go on until bad ways of working get so well established they are hard to correct.

4. Prefer genuine to make-believe performances. Be as realistic as your facilities and situation permit. Practicing one thing to learn another is hardly good enough. Practicing in an actual job situation is the most realistic and best if feasible from an operational standpoint. Internships or apprenticeships are often used as ways to combine learning with actual work. That frequently turns out to be more work than learning. A company that hires and assigns regular employees but does not instruct them may do little better with its apprentices or interns.

The immediate supervisor is the ideal instructor, if operationally feasible. That requires the supervisor to qualify in three ways: a) Knowing how to do the tasks. b) Being prepared to INSTRUCT. c) Having TIME to instruct. We hope a lot of supervisors will study this book and become genuine instructors of those they supervise. If you are one of those who want to do that, reread Part II carefully and start breaking down the tasks you direct into the STEPS for doing them. Then start doing

what we recommend in these chapters. If you do that, you may soon move to a higher management level and start a lot of other supervisors doing what you have just learned how to do for your subordinates.

5. Prefer physical to merely symbolic performances. Much learning is KINESTHETIC, or muscular in nature. Have physical tasks learned in HANDS-ON ways if feasible. People need to know what the right movements FEEL like. Much learning has to be in the muscles, not just the brain. Recent "left-brain, right-brain" psychological findings tell us that the right half is more space-minded, thing-minded, holistic, and creative. The left half is more involved with words, symbols, and logic. A centipede would have a lot of trouble if he had only WORDS to guide all those legs. Your learner has even more muscles to manipulate and coordinate in doing almost any task.

6. Try to get WHOLE performances instead of practicing "the parts" separately. The sequence and coordination of the parts of a task may be more important than any one of its parts. Those pieces don't join up well if practiced separately. The Gestalt psychology concept of wholeness, or CONFIGURATION, is important here. It is that the whole is greater than the sum of the parts. The difference is in the interrelations and interactions between the parts. Building those configurations may be the main aspect of the learning.

7. Try to have performance done ON THE JOB. Those JIT wartime supervisors were on-the-job instructors. They had the people and machines in their factory or office classrooms. They could hand a new employee a lesson sheet and explain the steps and key points. They could demonstrate the right way to bore a hole or inspect a bomb rack. They could observe the learner's effort to do it the way it was demonstrated. If a step was done right, a "That's fine" could reinforce it. If it was done wrong, it could be corrected.

A comparable plan could be good today, for millions of office workers, food handlers, nurses' aides, or data entry people. The same principle applies to contract negotiators, bank auditors, probation officers, or inspectors general. Could it be done with the people and activities under your charge or responsibility? How much of that realism and HANDS-ON instruction is possible in YOUR field?

8. Use simulations for some learnings. To learn parachute jumping you begin from a six-foot platform. The same principle goes for fire drills, naval battles, and surgical operations. Link trainers proved very helpful in pilot training. Simulations can reduce costs as well as risks. Some factory tasks can be practiced on scrap materials. Some skills can be gained by dry runs, pantomimes, role playing, or drawings on paper to represent physical acts such as football plays.

In using these substitute performances the main needs are to recognize their limitations and add all realism you can. A little serious effort can increase your inventiveness about these less-than-perfect substitutes.

People who are engaged in the activity can supplement your own inventiveness if you give them a chance and a way to help. We recommend listing and numbering the tasks for which you want such simulations invented. Then run a rotation workshop to get slips from knowledgeable people about simulations for each task. Many slips may suggest good ones, or perhaps some half-baked ones that can be refined into something grand. That will beat what you can do alone from blank paper.

9. Try the project method in group instruction. If you teach classes for in-service people, each a very heterogeneous group, the project method may help. Have each one take an individual project, to improve his or her own job, or some troublesome part of it. Teach them all how to do that, using this book and our previous book "Crawford Slip Method," as your textbooks and guidelines. Pick also one problem which all face even though perhaps in different ways. Work on this group problem as a group project by methods such as each might use for the individual projects. Carry this group project along concurrently with the home work each does on the individual project.

Use the BUZZ method freely for mutual aid between pairs or in groups of three to compare and improve each other's products or processes. You can instruct a large group this way and still get much help to individuals. The members of your class have much to give each other, and to learn from each other. Your role is to be a catalyst to foster that cross-fertilization. The composite know-how from the group project can be far better than you could give if you tried to supply all the remedies for all their troubles.



CHAPTER 9. EVALUATION

HOW TO DEAL WITH SUCCESSES AND FAILURES

The trial performance phase of learning is an EXPERIMENTAL effort to do an act right. Obviously some feedback about success or failure is important. Getting the right end result or product output is not enough. It might be achieved the hard way, with too much cost in money, material, time, or risk of accident. The learner may not know how close was the escape from a serious accident. The equivalent of a football coach could add enormously to the learning of some tasks that are typically left to trial and error. How good a coach are you for those in your charge?

The goal of instruction should be MASTERY of productive PERFORMANCE. The ultimate evaluation of it is productivity on the job. Your immediate need as an instructor is to measure power, capability, and patterns of behavior that will bring success on the job. Memory of facts, or number of hours spent in class, may bear little relation to actual capability. To "pass" or "get by," whether with 70% or 95% is quite secondary. Following are some thoughts on how to relate evaluations to actual competence.

1. Evaluate diagnostically. Analytical evaluations help more than total scores do. The learner needs to know "What did I do wrong" rather than merely "How well did I do?" A total failure might be due to one single mistake. Spotting that mistake may yield total success on the next trial.

2. Give feedback. Diagnosis leads to remedial instruction. Re-teach what went wrong. Coaching, tutoring, counseling, critiques, constructive criticisms, and many similar terms express this need. If you skip this feedback function, you automatically give permission to do slovenly work on the job. If you don't give a "well done" or other sign of approval for what is done right, you miss a golden opportunity. Verification of successes can go side by side with correcting of errors. Doing this PROMPTLY can multiply the speed of learning. Close checking during the very first trials may be the most fruitful of all your evaluations.

In all this coaching the goal is INSIGHT. Your learner needs to CATCH ON. This may occur easily for nine-tenths of an act. You might make it happen for the other one-tenth by your remedial coaching. Mastery may come as a "flash of insight" because of what you supply. Your time is far better spent that way than in clearing up confusion from errors that got built in as a way of life on the job.

3. Define your standards of expectations. Set standards at the outset. You can't check success or failure if you have not defined either. Our workshop slips by the thousands tell us that many workers are started on jobs with very little guidance. If standards are too vague for you to check, then how can the learner learn to meet them? Can you make a checklist that you could use to evaluate the tasks you teach or direct? Can

you do for more of those tasks what is done for a pilot's checklist?

Such a checklist of standards may not be possible for some of the tasks which you teach or direct. Each of them represents *UNFINISHED BUSINESS* in your productivity improvement efforts. The Crawford slip method may help you to get more of those uncontrolled tasks done more precisely. Writing down the directions step by step on slips can make possible some agreements on best ways. We call this *PROCEDURE WRITING*. A later chapter in this book will elaborate this.

4. Use precision tools and devices when possible. "Too long" is not a very precise criticism. HOW MUCH too long may be revealed by a ruler or tape measure. Perhaps it is ONE TEN-THOUSANDTHS of an inch too long. There are tools and technologies for extremely precise measurements of all sorts of things and phenomena. We have moved much further into such precision technologies about THINGS than we have about human performances of work. The equivalent of stop watches, spectroscopes, videotapes, thermometers, X-rays, personality tests, and batting averages can be INVENTED for almost any activity. Many already exist that you have merely not thought of using. Simply have a workshop audience of productivity improvers in your field write slips about possible precision devices or techniques. Some half-baked or impractical ones may be ripened into better ones because of other slips that may be equally imperfect but in different ways. Time spent that way can do more good than in clearing up confusion caused by bad work.

5. Apply and improve tests and testing. Paper-and-pencil tests of many kinds (essay, true-false, multiple choice, completion, etc.) can vary greatly in value. They usually measure memory, or the IDEATIONAL parts of the learning process. (The left side of the brain.) Failing such tests may be a bad sign. But passing does not guarantee performance capability. A person may know and understand well but be unable to perform for many reasons. These reasons could range from lack of dexterity to being an amputee.

A very common weakness of such tests is their measurement of memory instead of understanding of the rationale of tasks. A true-false test of WHAT IS may be improved by items of the YOU SHOULD type. Testing such judgments about what ways are best comes closer to real behavior measurement than does testing of definitions and factual memories.

6. Make subjective judgments about some performances. Evaluate subjectively if objective ways are not available. Champion glee clubs may have to be chosen that way. So must some high diving contests, and hundreds of other activities. But there is much room for improvement in such judging. World Series umpires did not get chosen by lottery. Nor did the coaches who trained the players. The art of SEEING MORE of the fine points in basketball or aircraft piloting is subject to improvement. Champions are developed

by instructors who can ANALYZE their movements and feed back evaluative judgments about more of the specific components of the performance. Over-all judgments without such analysis are less effective or accurate.

7. Use score cards, rating scales, and checklists to improve subjective judgments. Judging a performance analytically can add objectivity. Your diagnostic role calls for such analysis. A checklist of the components or aspects or features or attributes can aid the learner to get more CONSCIOUS control of some things formerly done blindly. Such analytical aids improve PENETRATION into the process, by both you and the learner. Match these ratings to the DIRECTIONS you give the learner as much as you can. As with other aspects of instruction, a rotation workshop can yield some very helpful slips from an audience of productivity improvers in your area of effort.

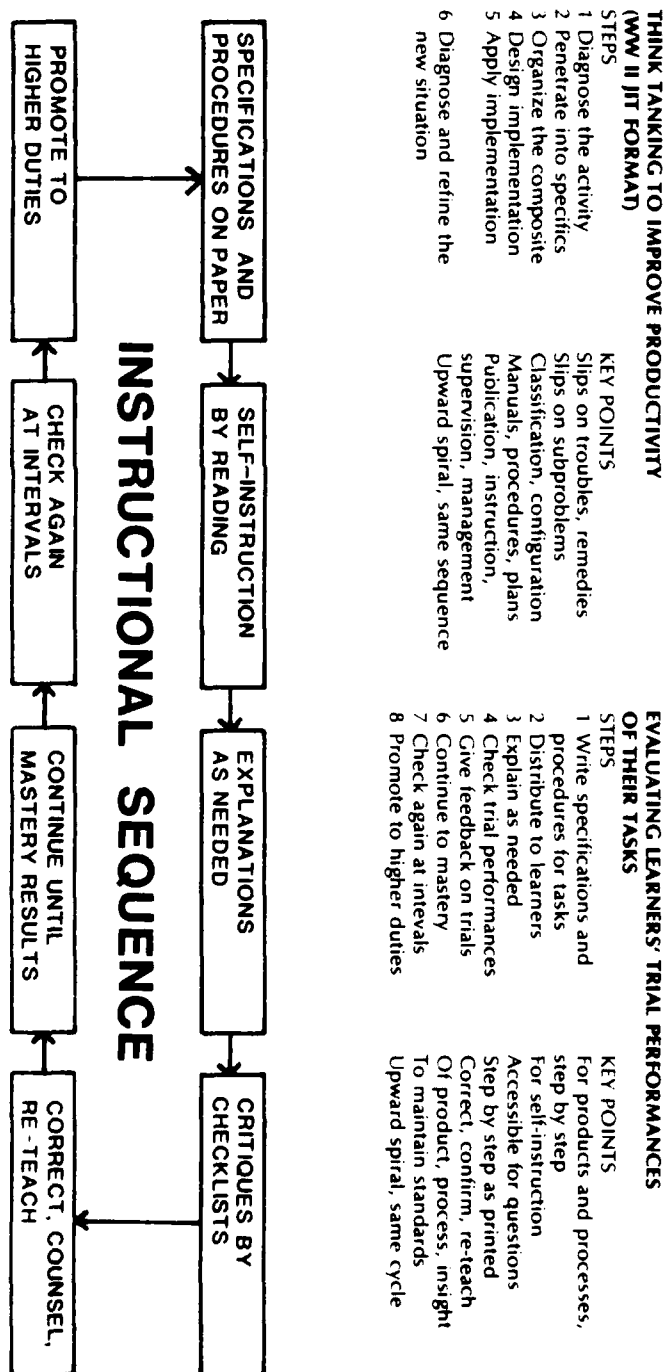
8. Have learners evaluate others, and themselves. Peer evaluation can be a great cost reducer if well done. The quick learners may soon do some of it as well as you can. Again, we recommend the BUZZ session for mutual aid among learners. Forming pairs or groups of three to criticize each others' performance may multiply your role as an evaluator. You soon have some "assistant coaches." Their learning to help their classmates or colleagues is good learning for themselves. You can teach a larger class if you perfect such a plan. You can supervise and direct more employees if you build that kind of team work among peers under you.

9. Supervise by evaluation. The World War II Job Instructor Training (JIT) program cast the first line supervisor in the role of instructor. He or she broke the tasks down to steps and key points. Next was to demonstrate and explain these. That led to the learner's own effort to do the task right. The supervisor's diagnostic feedback guided the next trial. In a very short time the new employee was in full production of a simple and repetitive task. Very soon that supervisor went to a higher role, supervising more complex activities. The fast learner became the supervisor. He or she had learned how by a good example and some practice in mutual aid among peers. Our present economy might benefit by your taking such a role.

What JIT was doing for simple repetitive tasks can be adapted to more complex ones. The steps in the tasks may be more numerous and more like outlines than lists. So may the key points under them. Instead of a one-page lesson plan you may have a chapter in a manual. That is what APPLIED AUTHORSHIP is for. Later chapters will elaborate that.

10. Seek evaluation of your own instructing. Those whom you instruct, whether in a class or one to one, can give you wome valuable feedback if they have a safe way. Universities sometimes have students rate professors by rating scales or evaluation sheets at the last meetings of classes. If such feedback goes directly to the instructor it becomes an invitation to flattery and has

doubtful value. If the items are too broad and general, they may not help anyone very much. We recommend instead having each student write slips telling the professor what was good or bad or needs improving the next time. The slips must be sealed in the presence of all, and delivered to a central evaluation office. There some trained clerks can write, type, or record them, or key words from them, to transmit to the professors. This gets independent and anonymous feedback that is otherwise impossible. A university budget might not bear that much clerical expense. But even if this is just a dream, does it trigger any ideas that might help you to see yourself as those you instruct see you?



PART III. APPLIED AUTHORSHIP

How to put know-how on paper

By applied authorship you can reach more learners. More people look to you for help. You can gain leadership status and career advancement. You write as a CRAFTSMAN, not artist. You don't depend on some mysterious hereditary gift. You succeed by orderly handling of ideas written on slips. The following chapters will explain how.

CHAPTER 10. HANDWRITTEN METHODS

HOW TO COMPOSE ON SLIPS

A. CONTENT

How to mobilize your material

"Every word worth reading" is your basic rule as an author. Publication cost per word can be high. Value to readers should exceed that. Otherwise you are not PRODUCTIVE as an author. Following are some tips born of experience.

1. Make a space budget. How many pages or words are you about to turn out? You face several constraints: a) How much can available funds pay for printing? b) How much detail do your readers need? c) How much do you really KNOW or can ASSEMBLE to meet that need? The home-building analogy applies. You don't start a big house if funds are low and family is small. You don't start a KIND of house for which building materials are unavailable. An unfinished building or book does you or others little good.

Figure book or article space by CHARACTERS, not words. Words vary in length. They are hard to count dependably for space estimates. Typewriters produce either 10 or 12 characters per inch. A ruler can tell in a moment how many characters per line or per page you have typed. You may even estimate by THICKNESS of slips in chapters. By typing a page or two of your copy from typical slips you can predict future pages fairly well by number of slips. The larger your test sample the more precise is your prediction.

We prefer 12-pitch to 10-pitch typing because it gets 20% more on a line or page and cuts cost accordingly. If you will be printing in a BOOK type, we recommend 10-POINT (not to be confused with 10-PITCH) type on a 12-point face. This gets the same number of lines per column inch but 33% MORE CHARACTERS per line than does a 12-pitch typewriter, 60% MORE THAN DOES A 10 PITCH TYPEWRITER. That is because the 10-point type yields about 16 characters per inch. That is a typical type size in educational books. Such space factors in a manuscript resemble measurements a builder makes before digging ditches or cutting lumber.

2. Assemble a SURPLUS of content. Write by BOILING DOWN, not beefing up. Spreading a little know-how too thin can yield substandard copy. Having several wordings on slips before you for a certain idea

permits you to choose the very best. This sharpens your message and adds language power.

3. Warm up your brain before writing sentences or paragraphs. A "mental low gear" warm-up was done for each chapter you are now reading. You can "write the chapter" in a spontaneous way by just writing one slip after another as fast as they come to mind. You may skip around, repeat yourself, or word the same idea several ways without committing yourself to any of these wording. You can take these ideas out of your own head or any slips or other material that may be relevant. They help you to "get in the mood." They may also add meditation to content you already had. This kind of meditation is aided by padding slips together like little tablets so you can turn them more easily, yet tear all off for looseleaf handling when ready to organize and write.

B. Organization

How to structure your content

1. Classify slips precisely. Your collected slips may be mere RAW raw material. Segregate them to become your parts, chapters, sections, and paragraphs. Kindred paragraph piles may become your sections. Kindred sections become chapters. They in turn form your larger parts.

Working up from the paragraph level is usually better than splitting up larger categories. This structuring of the thought pattern is your topmost professional challenge. Our topmost guideline for it is to use ACTION categories rather than mere conceptual or informational ones. The HOW TO language format will probably help you most to do that. Cases and people vary so much that we can offer no rigid recipe for forming all your structures. The outline structure of this chapter may illustrate our point.

2. Keep your slip clusters in physically manageable form. Material handling is as essential in authorship as in manufacturing. You can't write well at a cluttered table in a cluttered room. Orderly handling ranks with good classification. Clips, bands, boxes, or other containers should make clear what is what and where. A classification card with an index term on it can identify a small unit. A label on a box can identify a larger unit. This systematic identification and control of slips FROM which you write is also needed for WHAT you write. Hundreds or thousands of slips in various stages of processing are too much to trust to memory. What you are sure about today may be puzzling next week. Memory is too short to trust without some memory aids.

3. Hold down the overlapping of your units. When writing one unit, whether chapter, section, or paragraph, keep the others in mind. Each one tempts you to spread out like waves that go out from the pebble you drop in a pond. Unless you control this expansion, you will end up in confusion, frustration, and failure. The goal is to make your units mutually exclusive while

combined they cover the whole of your subject. But mutual exclusiveness is never completely possible, however much you wish it were. So try to VARY what you must repeat by wording it each time to fit that particular setting or context. To leave it out and promise to "cover it later" may be to lose much of its value. This age-old cross reference problem can tax your best professional perspective. Try to trim off the less relevant tangent ideas. Putting your whole book or article on slips before you commit it to sheets is a good way to keep all those interlocking circles under control.

4. Display your outline. The STRUCTURE of your message may be its most meaningful part. The pieces of a jigsaw picture have no meaning until put into the picture configuration. The whole becomes infinitely greater than the sum of its parts when the RELATION of the parts is made clear. Your success or failure may depend more on your outline than on any other factor.

5. Strive for a smooth flow of thought. Arrange the sequence of your sentences for best continuity. "Put your best foot forward." The same goes for your sentences. Six slips that were previously written separately can hardly become a connected paragraph without some re-wording and transition words. These transition words are like the cement that binds gravel and sand grains into concrete. Without them you would still have mere raw material.

6. Systematize your manuscript format. Standardize your format so items that are alike in meaning also LOOK alike. Parallel meanings call for like styles, outline symbols, underlinings, capitalization, or other ways to make the structure unmistakable. Avoid unbroken pages without paragraph heads or other typographical breaks. Word those as carefully as you would word traffic signs at road intersections. And avoid footnotes if you can get them into paragraphs instead.

C. STYLE

How to Impact your readers

Applied authorship resembles both engineering and sociology. Your readers are PEOPLE. Consider well how to reach and influence them.

1. Be DIRECTIVE, not merely informative. Applied authorship is to IMPROVE the way your learners PERFORM. You are teaching HOW TO DO the tasks or activities you have selected to upgrade. Promise to tell HOW TO, and keep that promise. Write as an ADVISOR and an ADVOCATE of the better way. SELL that better way. Write to persuade and convince the learner that this way is really better. Give the reasons and supporting information to make your way both understood and accepted. Take the responsibility that goes with advisor or counselor. Express your convictions, your reasons for them, and any evidence to back up those reasons. Write as counselor, advocate, and salesperson all combined. Neither your book nor a road sign exist as a mere ornament.

2. Write your own convictions in your own words.

Put your own thoughts and know-how on slips first by the mental low gear process. Get all the other know-how you can on additional slips. Write more of your own that emerge from slips from others. Let the others remind you or instruct you. By the time you are ready to write, you will have educated yourself considerably. You will possess a composite input far beyond what any one mind could have known, recalled, or expressed.

Treat all those slips, whether written by you or others, as true-false items. You may reverse some by your own second thoughts. The other slip writers are also human and may be wrong. Test each slip in the light of your own perspective of the whole. Advocate your views when you are sure. Present options or express doubts when you are not. Don't expect the impossible of yourself. Nobody knows all the answers. Express professional opinions, when you don't have something better.

Sometimes you need to use valuable information from copyrighted sources. Even that may best be written in your own words, with due credit to the sources. Doing so can avoid two major hurdles: a) Disjointed style from the switch from your style and format to what you quote. b) A great deal of secretarial time and delay to get permission to quote.

3. Write readably. Get and study Rudolph Hesch's "Art of Readable Writing." Write SHORT sentences. Four 10-word sentences beat one 40-word one. Comprehension begins to fade when too many phrases and clauses get run together. Readability drops rapidly as number of words increases.

Simple words beat the big ones for a similar reason. Words of six letters beat those of 16. The thousand most commonly used words go over better than those in the 20th thousand in the Thorndike word list. You are writing for LEARNERS, not Rhodes scholars or professors. Don't waste your time and printer's ink by erudite language.

Write as if talking to an individual learner. Use the pronoun YOU freely. It is the most beautiful word in the English language, at least to your reader. Avoid impersonal extremes such as "One should arrange one's time to ———." Along with the word YOU, use the imperative mood freely. Prefer active to passive voice. "Do it this way" goes over far better than "This is done by ———."

Finally, use dynamic and colorful language instead of prosaic abstractions. Image bearing words are easier to grasp. Cases, examples, and concrete analogies bring more of the difficult concepts within reach. Start a paragraph with an attention getting sentence if you can. Give a humorous twist if one comes to mind. There is no percentage gain by being stodgy and dull.

D. MANUSCRIPT QUALITY

How to make good sentences and paragraphs

1. "SHINGLE" your paragraphs, sentence after sentence. Write your paragraph head or topic sentence on your first slip. Lay it face up before you. Write your next sentence and let it overlap the blank part of that first one. Lay others in this same shingle fashion. Read the whole set as if they were on a PAGE. Study the sequence and wording very carefully for any possible improvements. Rearrange sequence if necessary. Rewrite slips as needed. If revisions might possibly confuse a typist, rewrite the slip.

2. Keep paragraphs short. Ten sentences or less can be a good norm. A 14-sentence paragraph is like a 14-child "family." Could they all be full brothers or sisters? When paragraphs get long, classify your thoughts and make more paragraphs. You may have two or more rows or shingles under one paragraph head. But a long string of paragraphs without paragraph heads is like an orphan's home. Your readers will not be as able as you are to structure your message.

Always INDENT for a new paragraph. The common practice of flush left paragraphing presents some technical problems in publishing. It is a questionable practice even for your business letters. And always use a paragraph sign to let your typist know when to indent for the next paragraph.

3. Refine what you write. Write FIT TO PRINT the first time, if you can. Loose sentences and erratic capitalizations can discredit you. Get and study a STYLE BOOK if you don't know how to punctuate or form sentences. If others must "fix up" your sentences, they may distort their meanings. Become your own EDITOR as fast as you can. Start by shortening and simplifying your sentences.

Keep your drafts on the slips until all chapters, or at least large blocks, are completed. New insights come with time and other writing. Those may alter something you wrote last week. Typing up one chapter at a time risks too much retyping. Worse yet is that the ghost of rewritings past may scare you off from making all but the most critical revisions. You may not have a lot of daughters to copy your equivalent of Tolstoy's "War and Peace" over and over 13 times as his daughters did.

Don't be oversold on what word processing and computers can do to improve your manuscript. It is far easier to polish a draft by moving or rewriting slips than by doing it electronically. The cost per page in electronic revision can be high. Only YOU can decide what to change. Make up your mind before, not after, the electronic processes begin. And proofread your slips for both correctness and LEGIBILITY.

4. Get critiques from others. Even after you have done your utmost refining, much more may be possi-

ble. Show a chapter to someone before you repeat a fault in 17 more chapters. Some colleagues might revise a sample as a friendly favor. An editorial expert can help you about language. A technical expert may catch some errors of technology. A beginner, or learner, can tell you if it is understandable. Sometimes a public relations factor can justify a careful check for expressions that could be offensive. Or you might need a check for national security or proprietary confidentiality. So important are such factors that publishers put your manuscripts through such screenings before they take a chance. Can you do any less, to avoid a rejection after all that work?

Coauthorship can give you at least one other person's point of view. Both can merge content slips. Both can review and critique drafts. In such joint efforts it is important to confer about changes. The "improver" is not always right.

E. STAMINA

How to avoid burnout

One good rule of authorship is LONG HOURS. There is no royal road, even if paved with Crawford slips. But you can reduce years to months or weeks by some better technologies.

You may think your BRAIN is all tired out. More likely it is your BACK and SEAT muscles instead. Break long writing periods by change-of-pace physical activities. Spread your eight-hour day from early morning to bedtime, with other activities in between. Work where you can leave everything undisturbed while you go to the bank or mow the lawn or take a nap. Crawford wrote a book in Washington at the Library of Congress that way. Congressional hearings and sightseeing and negotiations about future publications broke the 9 A.M. to 9 P.M. monotony.

Crawford works in a "contour chair." It is like a chaise lounge. A moveable lap board serves as a table top. Back and legs are in a very relaxed posture. Writing for hours at a time is very easy. If boredom sets in, the World Series may be on the T. V. in the adjoining room. When a book is finished and being printed, painting the house is a good way to get an inspiration for another one.

COMPOSING A PARAGRAPH ON SLIPS (WW II JIT FORMAT)

STEPS	KEY POINTS
1 Lay data slips like shingles	To make all visible
2 Arrange for sequence	Best flow of thought
3 Underline a heading	Physically distinct
4 Write printable sentences	Best wordings, flow
5 Lay like shingles	For page effect
6 Revise as needed	To polish, refine
7 Reverse slip sequence	As if for typist
8 Clip heading at top	Corners evened up
9 Refine later	For second thoughts

CHAPTER 11. DICTATION METHOD HOW TO DICTATE KNOW-HOW

Much of the chapter on the handwritten method applies equally to dictation. We pick up from there.

A. PRO OR CON

Whether and how to dictate

1. Weigh advantages and disadvantages carefully.

A surgeon who does three major operations per day has little option about how to prepare written case records. If your time is worth \$60 per hour (\$1.00 per minute), every minute counts.

If your handwriting is illegible and you can't type, you need to dictate. Your spoken words may be more understandable. If many of those in your charge don't use the English language correctly, you may have them dictate. Many can say what they mean better than they can write it. An educated typist may make it all come out acceptably. Letters or papers for one reader, or a few, may be processed this way.

But dictation tends to be more wordy and less precise than what you write out. Also dictation tempts to rambling. Editorial quality goes down. Those who type must know your special vocabulary or technical jargon in order to type it. Legal and medical secretaries are not readily interchangeable even if obtainable. These disadvantages can be overcome if you try. There is much to be gained if you do.

2. Choose wisely what you will dictate. If your raw data slips come from printed sources, dictation can save you some notetaking time. Speak what you would otherwise write on slips from books you read. Someone else can type it on slips. Be sure to separate the items you want typed. The word "next" may indicate a new slip. If your printed matter can be marked or underlined, you may even save the dictation.

3. Dictate routine business letters or papers. Run-of-the-mill correspondence often repeats the same patterns in letter after letter with minor variations. Those usually go to one or only a few readers. That is the kind of dictation that comes to mind first. That is NOT what this chapter is about.

4. If you dictate for publication, learn HOW first. What you write for many highly qualified professional readers had better be good. Run-of-the-mill dictation is not usually that good. A "quick-and-dirty" manuscript will probably be rejected or if published may discredit you. The rest of this chapter has some tips on how to do it better.

B. TECHNOLOGY

How to choose your system

1. For some needs, buy your own equipment. Before the electronic revolution you could buy your own dictaphone or ediphone and record your voice on a

cylindrical wax record. Your typist could transcribe it on a different machine. Once typed, the record could be SHAVED on a third machine. After many shavings you started over with new records. All this was done in your office or one near by. The three machines were a substantial capital investment, in terms of dollars of those times. Later on we got electronic equipment that cut sound tracks on plastic disks. Those performed better and cost more and were used in similar ways.

Now you have so many kinds of equipment to choose from that we will not even try to describe them. They may be different before this book gets printed. If you are considering purchase of such a system, consider well your volume and regularity of workload for it. You might have a wrong system, either insufficient for your needs or wastefully beyond them. If you have expensive apparatus idle much of the time but insufficient for peak loads, you may have decided wrong. Idle personnel, or shortages of personnel when needed, may be a major cost. How much and what kind of dictation will you really do? How much of that has any resemblance to the APPLIED AUTHORSHIP we are considering?

2. For intermittent authorship, prefer remote dictation. Your manuscript dictation may come in a flood after a long period of no dictation at all. You spend weeks getting your slips into chapter, section, and paragraph piles. When you start dictating, you may need it transcribed in a hurry. This feast-or-famine factor makes a central transcribing service very important. If you are in a large organization, you probably already have one. If you have special recorders in the offices, they must be compatible with the central transcribers.

The movement seems to be away from the many small pieces of apparatus. The more sophisticated central system can be dialed for dictation from telephones. You can dictate by telephone at any time from anywhere. Day or night makes no difference if you can reach a telephone. You get your transcribed copy by interoffice delivery, special messenger, or mail, as arranged. You or your employer may pay a penny a word for dictation and twice that for transcription. The personnel pool and volume of work are large enough to even out the overloads and shortages of work at the transcribing center. Costs may be high as compared to pecking it out on a typewriter yourself. We are in a new era.

3. Consider word processing. You have two options about your transcribed copy: a) Typed and delivered in final form, direct from your dictation. b) Done on computerized equipment for expected revisions by you. A word processing machine can let you add or remove a word, page, or chapter, and then put it all back into connected form. That is a valuable feature for last-minute refinements. Think carefully about your need for this feature. Dictation is likely to require it. It may cost twice as much and be worth far more than that. Much depends on what you intend to do from that point

on.

If you want camera ready copy for printing, there are several questions worth asking: a) Are the available type sizes and styles right for your publication needs? b) Can you get right ends of lines justified (evened up)? c) Can you get the number of letters per inch which you want? d) Can words be underlined? e) How many out-line levels can be distinguished by different type styles? f) Others that are unique to your needs. Many word processors have only a few type styles. Most of these look like TYPEWRITING, not like BOOKS. Typical book type styles have about 16 characters per inch. Your word processor may have far fewer. For example, a 10-pitch machine will make 20% more lines or pages than a 12-pitch one. Transcribing to the 16-pitch book style could cut printing costs to about 60% of what a 10-pitch typing would cost. You might do well to pay more for computerized typesetting. You would still have the easy revision feature. And you would have the more professional BOOK appearance.

4. Follow some quite specific procedures. All this is far from the simple life. Technological and organizational complexity require you to accept some regimentation. You have to fit your actions to the hardware and the people on whom you will depend. The rules may be very specific, and very RIGID. An Air Force base that relies on a central word processing center for most of its letters and documents printed a seven-page USER GUIDE. It was double column and small type. It told what you had to do and why it had to be that way. It was a combination procedure and training manual. Dictation was done by telephone to a central recording and transcribing facility. The manual taught several thousand people how to dictate so they could get their work transcribed right.

A simpler procedure guide is printed on a card by the California Transcribing Service (6010 Wilshire Bl., Los Angeles, Ca 90036, Tel. 213-857-5566). Medical dictation is a large part of their work. Doctors dictate from telephones at any time from any place. They print the following list of instructions:

- a. Dial dictation number shown below.
- b. Give your code number.
- c. If you have more than one letterhead, specify which one is to be used.
- d. State copies required, if any.
- e. Specify if you want your dictation signed by us and mailed to addressee.
- f. Spell out all names and streets.
- g. Speak clearly and distinctly into telephone receiver.
- h. After you are through dictating, please state same and hang up your receiver.

The Air Force user's guide needed much more than this because of the large number and variety of users, and the high turnover of military personnel.

C. DICTATED CONTENT

What to say or submit

1. Dictate from prepared notes, preferably on slips. Dictation fit to print requires some quite specific notes from which to speak. Your classified data base notes give you a huge reserve from which to choose. Your classified categories give you some more selective guidelines. When these are broken down to the small paragraph level, you have raw material to fit into actual sentences. You may have 20 or more slips of raw material for one paragraph. Lay these out like shingles. Sequence them in the order that seems best. Several may say the same thing in different words. Pick the best. Some can become a string of nouns or of adjectives separated by commas, in one sentence. Make up your mind and say it.

If you are dictating into a small recorder, you need a stop-and-go capability on it. Otherwise you waste costly transcriber time listening to blank periods. You may alternate speaking with consulting your notes. The remote dictation systems may stop and start by the sound of your voice. Make that a clear and definite signal.

2. Direct the one who will transcribe. A typist whom you never see can't read your mind, especially about FORMATS, or even punctuation. All she or he has to go by is what you say. Dozens of formats wanted by other customers may be typed in a week's work. Others' formats and punctuation preferences get sandwiched in between periods of typing for you. How can a typist remember what you wanted a week ago? The safe way is to dictate every comma or capital letter, and every special indentation or underlining.

3. Always get and check proofs, very carefully. Never trust a typist or typesetter to get everything right. One misplaced letter in a word can sometimes cause an utterly different meaning. And never trust yourself to catch all errors at one reading of the proofs. You can read a page of proofs several times and still have a wrong zip code or hour for a meeting. You may see what you expect instead of what is there. A reading tomorrow may still miss some you missed today. Someone who didn't write it can catch some you missed. Don't let all your precious effort be spoiled by laxity at this point. Make your corrections unmistakable, even if you can't understand all the standard proofreaders' symbols. Then check again after these corrections are made by the typesetter. New mistakes can occur while correcting the old ones.

D. MANUSCRIPT SYNTHESIS

How to put it all together

1. Expect and prepare for some paste-up work. There may be more to a manuscript than just transcrib-

ing paragraphs. There may be galley to be cut to column lengths and paired. Corrections or additions may need to be pasted in before that is done. Drawings or tables or other special exhibits may have to be inserted. You may need a line at the top for the page number, and possibly the chapter identification. Page numbers that are CENTERED are best if your two-sided publication is to be duplicated by others on their copy machines.

Such paste-up work may require a specialist. But whoever does it must understand your manuscript and the purposes of the paste-ups. A joint effort by both of you helps.

Much of the simple paste-ups can be done by you if you are a do-it-yourselfer. Use rubber cement rather than a glue that is permanent. Special waxed paper can be bought which permits removal or realignment. A major problem is faulty alignment. A tiny bit off parallel can make a line say "Amateur at work." Paste-up services are usually priced by the hour. Your understanding of it can reduce its cost.

2. Use art work to teach, not to decorate. Use visuals to guide or improve your readers' ACTIONS. A small drawing within one column may often do this quite well. Use single lines, with no shadings, so the drawing can be reproduced well by copy machines. Avoid colors entirely. They don't do well on copy machines. They run up printing costs enormously. Avoid lines so close together that ink fills in between them and spoils appearance. Prefer drawings to photos for several reasons: a) They require no halftone screening. b) They cost less. c) They reproduce better on copy machines. d) They can be more SELECTIVE than photos.

This selectivity concept deserves emphasis. Your main point may be missed if the reader's eye is drawn to some irrelevant feature. So leave out everything you can that is not absolutely essential. Explain this to your artist. Make sure that the mission of the drawing is understood. Provide a pencil sketch, however crude, if necessary. Get a tentative pencil sketch from the artist before it is inked in finally in printable black and white.



CHAPTER 12. WORKSHOP METHOD HOW TO DO PROCEDURE WRITING

Previous chapters dealt mainly with ADVICE about how to do tasks. But some tasks are so crucial that advice is not good enough. Some **MUST** be done right. Three Mile Island taught us that. Tasks may get done right but not **EFFICIENTLY**. If a wall can be painted as well in one hour as the present two, the present way needs scrutiny. Procedure writing is to get work done right and efficiently. This chapter points the way.

A. NEED FOR PROCEDURES

Why standardize tasks or interactions

1. Existing "Rules and Regulations" are unsatisfactory. By the thousands our workshop slips complain about the rules and regulations under which work is done. This is true whether audiences were industrial, financial, governmental, military, medical, or educational. Typical complaints: Unavailable, non-existent, vague, ambiguous, obsolete, inconsistent, voluminous, legalistic, technically wrong, jargon, impossible to obey. Almost never does a slip give us a good word about them. We spend billions on litigation about some of them. We spend other billions because of confusion related to them.

2. Top-down procedure writing doesn't work well. Legislators, bureaucrats, and managers tend to be **GENERALISTS** about what they regulate. They write in general terms. They leave the specifics to be worked out lower down. Sometimes they do get specific and prescribe something that is unsound or impossible. They don't have time to listen to all the "little people" who tighten nuts on bolts.

This "delegation of details" goes on down the line. A middle manager may delegate such details to a first line supervisor who became one last week. He or she may have become a supervisor after halfway learning by trial and error the kind of work to be supervised. Our workshop slips from all levels say their subordinates, supervisors, and they themselves are "delegating" details which they are not sure about. They say they got too little guidance from above and can give too little to those they direct. In some cases they don't **DARE** to take responsibility for directing what might turn out badly and bring penalties on them. The outcome of this "delegation" is the low state of productivity in our whole economy and social order. We have overdone the job environment concept when we "delegate" too much to the lowest person on the totem pole.

3. Regimentation is not inherently bad. Some **BEST WAYS** had better be **PRESCRIBED**. Traffic codes and traffic officers are absolutely necessary. The extreme opposite of regimentation is **ANARCHY**. In between we have mere inefficiency, confusion, and unhappy employees just muddling through. Many people would welcome more stability. An orchestra is "regimented"

by sheet music and a conductor who knows how to get it played. Should we do any less in the world of work?

4. Not all tasks or interactions need regimentation.

Most tasks are done right and efficiently. Advice can add more tasks to that list. Most of the trouble appears in a relatively few. The Pareto principle says it well: About 20% of the situations yield about 80% of the trouble. Procedure writing is for that 20%. Our previous chapters dealt mainly with that 80%

B. NEED FOR WORKSHOPS

Why have groups write procedures

1. Most tasks involve or affect others. Seldom does any employee in a complex organization have sole control of anything. We are interdependent. One's error can foul up another's work. Your right to do it your way stops when your way interferes with others. We need the equivalent of traffic laws and officers in the workplace. Almost every kind of work and every level of authority has some stake in the way the others operate. What they lack is a way to communicate their needs to the others, and to get agreement on ways to meet those needs. The procedure writing workshops we recommend can go far toward getting that communication and agreement.

2. All who are affected need to communicate, agree, and document what they agree on. Our workshop plan for procedure writing is like negotiating and signing a treaty among several nations. Each party may want more than other interacting parties can give. They bargain, adjust their differences, and **SIGN** their acceptance of the new relationships. To do this somebody makes a draft of a proposed arrangement. Others **IMPROVE** on that draft proposal by offering revisions and reasons for them. Writers and improvers make concessions and agree on a compromise. This may be repeated, with many improvers and further revisions. All this goes on under negotiators who know and who are **AUTHORIZED**. Our workshop plan assembles representatives of the relevant specialties, functions, disciplines, and managers. Involvement of all parties assures commitment to the success of the new procedures that are agreed on. This process takes less time than most current coordination methods in business and government. And it is more effective.

C. EDITORIAL CONTROL

Why standardize language and format

1. Compatibility of parts is essential for an assembled composite. Our kind of workshops can write good procedures in a short time if under very tight and precise editorial control. Without that we don't advise your trying one. Momentum builds up fast if done right. Utter confusion and frustration would otherwise reign. You may be about to write 100 pages to direct 200 tasks or interactions. You may handle thousands of specific

work directions, each one a sentence. These must match the tasks, be readable, in correct English, with parallel ideas in parallel language, in right sequence, in consistent format, and technically CORRECT. In other words, you are setting up an EDITORIAL ASSEMBLY LINE. Assembling all those words, sentences, and lists of steps is comparable to assembling all the hardware parts for an industrial assembly line. Should you dare to do either without a well designed SYSTEM?

2. TEACH the language styles and formats you want followed. Some editorial frontiers that especially need to be stabilized are: a) Task titles in -ING form. b) Directions in imperative mood. c) Sentences about 10-15 words. d) Task breakdowns to about 6-12 steps. e) Learners' language. f) Acronyms written out in addition to letters. A dozen examples of task titles from other activity fields can stabilize that feature in a hurry. A dozen examples in the imperative mood can soon get that under control. Reading a few long sentences and shortened versions of them can soon get one-liners written for nearly all task steps. A dozen acronyms and their full wordings in your preferred form can stabilize that feature. Collecting and criticizing (anonymously) some actual slips from your group can reinforce instruction quite realistically. Peoples MISTAKES carry more weight and have more teaching power than correct examples. By collecting and shuffling a sampling of these you don't cause anyone to lose face.

3. Do editorial follow-up after the workshop. Some irregularities will survive your best preventive efforts. Capitalization and punctuation especially will be inconsistent to some degree. Many sentences will still be too long or poorly worded. Technical correctness may be questionable in a few. The organizational structure of the whole must be designed in the light of the specifics that have just come in. Everything must be checked for possible morale or public relations effects. Running through all this is the question, "Is this FIT and READY to print and distribute?"

This editor-in-chief role requires a possibly hard-to-find combination of qualifications: a) The linguistic skills we always expect of an editor. b) The technical and managerial expertness we wish for in managers, planners, trainers, and security persons. Changing a sentence for linguistic reasons may distort meanings or cause errors if the editor does not understand the work that the sentence directs. Also the editing should open the way for the best possible use and implementation with the intended readers and users.

There may even be another editorial round after first publication. You may want to field test a first experimental edition to pick up any errors or needed changes that were missed. In that case you may build into it a request for readers to cite specific lines and pages they think should be changed.

4. Focus on LOCAL and IN-HOUSE needs of your specific organization. Procedure writing is seldom for a huge nationwide reader audience. It is for your OWN

company or organization. Your combination of facilities, equipment, personnel, and resources is like no other. Procedures that are broad enough to fit all would not fit yours exactly. That is one reason why existing rules and regulations draw so much complaint. Your publication and distribution plans will naturally be local for this reason.

D. WORKSHOP PLANNING

How to conduct procedure writing sessions

This procedure writing workshop is unlikely to succeed unless you learn HOW TO DO IT. You need to be involved in one or more before you fully realize how crucial the editorial control is. You need an apprenticeship or "internship" as co-leader with one who knows how. This is far less automatic than an electric toaster. Space in this little book is not available to repeat several pages about it in Chapter 6 of the Crawford-Demidovich book, "Crawford Slip Method." We are giving here only a brief synopsis of it. But this can be by far your best productivity tool when you are ready to use it. We advise you to use the Crawford slip method in less critical applications before you attempt more than you are ready for.

1. Analyze troubles and remedies diagnostically first. A natural first step is a needs analysis. Do this by a diagnostic workshop to identify your problems and optional solutions. You may want to analyze these more intensively by the rotation workshop plan. That can yield a good over-all perspective, plus possible training materials on the ADVICE level. Training based on that material may be all your resources justify. By then you can be better able to decide whether to write procedures for the 20% of the tasks that need them most. See the diagram, "Crawford Slip Method Sequence" for the setting of what we have just outlined.

2. Make a TASK LIST analysis. If you decide to write procedures, a first workshop might be for TASK LISTS only. Careful study of your suggested tasks can yield a classified list of all the tasks you will want to cover in a second workshop. For your task list you need slips from people who want help, not necessarily the experts who know the ways to do them. See our previous book pages 29-32 for details of this.

3. Write and IMPROVE the procedure drafts. Your classified task list can help you to decide on persons to include in the procedure writing workshop. Invite those who KNOW, because you want valid know-how from them. Cover all the interacting functions, disciplines, or specialties that interact in this work. Then follow the workshop steps and key points shown in "Standardizing Performance of Tasks or Interactions." Refer to our previous book for more details on these steps.

4. Get your procedures approved. If you need new procedures, don't expect busy people higher up to write them for you. Write them and present them for approval. Get into your workshop those who have au-

thority to approve or recommend approval, if you can. If you can't involve them, then prepare a POSITION PAPER to send up in support of procedures you want cleared. Think this through well and draft it with care. Managers are CAUTIOUS, as they should be. Tell WHY your procedures are needed. Give evidence. Meet possible objections. Those who help write the procedures can give you a fine set of slips for your position paper in a few minutes near the end of your session. Doing so prepares each of them to be a better salesperson for the fruit of their workshop labors.

WRITING PROCEDURES FOR TASKS OR INTERACTIONS (WW II JIT FORMAT)

STEPS

- 1 Identify troublesome tasks, interactions
- 2 Get drafts of steps
- 3 Get drafts improved
- 4 Get drafts signed
- 5 Get drafts adopted
- 6 Get drafts edited
- 7 Make procedures known
- 8 Train for application
- 9 Get compliance

KEY POINTS

Get slips from workshops

Each writes, signs for steps

Peers confer, revise, agree

Improvers sign after agreeing

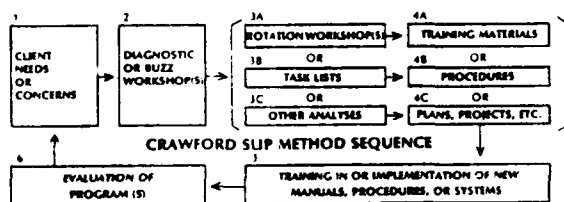
Approvers are among improvers

For English, technology, legality, security, public relations

Publish, post, instruct

Self-instruction, supervision

Control, mandatory standards



CRAWFORD SLIP METHOD SEQUENCE

STANDARDIZING PERFORMANCE OF TROUBLESOME TASKS OR INTERACTIONS (Task title)	
NOTE: Below are directions for procedure writing, done in a format used in the World War II JOB INSTRUCTOR TRAINING program (JIT). This format was used to train millions for specific wartime tasks. Millions of sheets like this were printed, mimeographed, hectographed, even handwritten, to put new people to work. Entries here are in terms of procedure writing by the Crawford slip method	
TASK STEPS	KEY POINTS
1 Identify troublesome tasks	Each person writes task title slips for over-all task lists
2 Write first drafts of procedures	Each writes and SIGNS directions for tasks in own areas of expertise
3 Get drafts improved	Pairs confer, discuss and agree on both steps and wording
4 Get drafts signed	Each improver signs after agreement with previous signers
5 Get drafts adopted	Include among improver's persons with authority to approve and adopt
6 Get signed drafts checked	Edit for English, technology, legality, security, public relations, etc.
7 Make procedures known	Print, publish or post where they can be followed
8 Train for understanding and application of procedures	Use self-instruction on the job, training or classes
9 Get compliance	Apply controls, discipline or enforcement as needed

PART IV. PUBLICATION

How to reach your intended learners

Without a distribution outlet your writing may be a mere exercise in self-education. The chapters which follow tell how to make it serve others as well.

CHAPTER 13. PRINTED PUBLICATION HOW TO DISTRIBUTE KNOW-HOW ON PAPER

Authorship plans and publication plans should be combined with a single MISSION plan. Neither can be very realistic without the other. This chapter can help you to combine them.

A. PRODUCT

What kind of printed unit to distribute

1. SIZE: How many words or pages to print. How much can you say without spreading yourself too thin? How much can your readers take without getting bored by excess detail? How much can you or your publisher afford to spend to print it? How many people could afford the price for a thick book about pacemakers or patios or penguins?

A journal article might be your best beginning. It might test the market or pave the way for your book. It can add credibility to you as an authority in your field. Writing it can improve your own perspective and professional insights about both your subject and your market. Even if you are already well into your book, one chapter of it might become the basis for such an article. Or you might publish the structure of your book as a course syllabus for use in a course for a semester or two. Teaching from that syllabus can help greatly in refining your eventual textbook. Publishing a small unit of high quality is safer than a premature venture on a grand scale. But even as you produce the small unit keep the bigger ones in mind. AIM HIGH.

2. QUANTITIES: How many copies to print. Unit printing costs fall as quantities rise. Storage costs on unsold copies may go on at a constant rate. Excess copies are hard to burn and bring little as waste paper. Some writings are best duplicated on a copy machine at a few cents per page. Collating, stapling, punching for notebooks, postage costs for mailing, etc., add up at a constant rate. If your market is small or unpredictable, these costs may be preferable to those of a larger printing.

A small printing at an instant print shop may enable you to plan better for a greatly improved and revised edition a year or two hence. Feedback from your first few readers can educate you about the many you hope to reach eventually. An article in a journal of small circulation might prepare you for a later article in one with a greater reach or status. Your best service may be by an APPLIED message to a few instead of a GENERAL one to many.

3. SPECIFICATIONS: How to select the best physical format. Standard 8½ x 11 inch paper has many advantages regarding printing costs and reader use. Other sizes create problems with copy machines. But the long lines and long eye sweeps give readers some trouble. Double spacing makes the return sweep easier. But it doubles the number of pages and printing costs. Double columns make the return sweeps easier and permit single spacing. But double columns add problems about typing, word processing, typesetting, and paste-up for camera ready pages.

These cross-currents about costs and reader uses deserve careful thought. Begin that study as soon as you can. Each case may differ, depending on your intended market and available resources. We lean toward the standard 8½ x 11 inch size for much of your APPLIED publication. Such a plan is well suited to the smaller units and smaller quantities for development of new materials for new needs and unpredictable markets. It makes it possible for you to have holes drilled for insertion in three-ring notebooks.

But whatever the physical specifications, it is important to give your material the IMAGE OF A PUBLICATION. That includes: a) A definite title. b) Clearly identified authorship or source. c) Clear identification of the person, office, or institutional sponsor and source of copies. Far too many otherwise good materials become mere "sheets of paper" because not so identified.

If your number of pages and copies warrants binding, we lean to SADDLE STITCHING. Such a book can still be drilled for notebooks. Pages can be put in a copy machine more easily than if in plastic rings. Production costs are less because of machine folding and stitching.

B. PUBLISHERS

How to get a distributor for your work

Publishers specialize. They are also business enterprises. They select manuscripts that are in their own fields and will also attract enough readers to justify costs. Their editors know much about their readers' interests. You call on them, not they you, until you are well established. Here are a few tips on how to find the right one for you.

1. LIBRARY AIDS: How to find who publishes what. A big library will likely have the CUMULATIVE INDEX. This indexes most BOOKS that are published in the English language. It is updated and cumulated monthly, quarterly, annually and at longer intervals. All entries are classified by subject, with publishers given for each. Those who publish other works in your field are potential publishers for you. All the publishers are listed in a separate section in each issue.

The big libraries offer even better help in many applied fields, perhaps in yours. The publisher of the Cumulative Book Index also publishes the Education

Index, the Engineering Index, and numerous others like them. They are updated and cumulated in the same way. They include both the books and the journal articles in that one special field. Thus you get much more help for placing your articles. Look up articles in categories closest to yours. The journals in which they appeared are more likely to accept yours.

Big libraries will also probably have the Ayer Directory of Periodicals, or other directories like it. These supply not only addresses but very helpful guidance about specialization, frequencies, and circulation figures. Find likely journals through them, then check those specific journals for suitability to your needs of the moment. See how LONG their typical articles are. On what level of technical sophistication are they? To whom are their advertisements directed? With what professional association or interest group is the journal related? Get the exact address to which your manuscript is to be sent. It is not always the same as the publication office.

The smaller community libraries may have none of the above indexes or directories. Instead they may have such directories as Writer's Market or Literary Marketplace. These try to help authors to SELL manuscripts. Some supply far more guidance than the other directories, but regarding a less universal assortment of journals. Many of your own writings may need journals which these do not list. A big university library reference department can probably help you more.

2. MARKETING: How to get your publication SOLD or DISTRIBUTED. Your articles are automatically sold or distributed to captive audiences of subscribers. It is up to you to select a title, opening sentence, and message that will capture and hold reader attention. But for your books you may have no such readymade contacts. Your publisher must add promotional costs to printing costs in order to attract buyers. You can assist the marketing effort greatly by your awareness of types of readers and of ways to interest them. Publishers welcome all such help you can give. That help may become a factor in the ACCEPTANCE of your manuscript, as well as in its later promotion.

Manuscript submission can be the beginning of a long period of joint effort in a marketing enterprise. Author and publisher are mutually dependent. Editors are experts about content and marketing as well as language details. Their broader perspective is a rich resource for you. Help them all you can about what you know well. Confide in them about what you are not so sure about. Welcome their suggestions for manuscript improvements. You can learn much from them.

3. IN-HOUSE PUBLICATION: How to reach captive audiences of employees. Much applied authorship is for a very restricted readership within a single company or organizations. What you write is to improve performance of a specific kind of work. The employer has good reason to get your compiled know-how to those who need to learn it. Your employer is your best

publisher in such a case. Your immediate superior may be the one to whom you submit your manuscript. He or she may or may not have all the expertise of the editor of a publishing house. The proposal may need to go higher up for a decision.

But managers may be slow to ORDER employers to study what you wrote. Think how your material will appeal to its intended readers. Try it out on a few whom you know well. Plan the marketing strategy that will help it with the others. Present your manuscript and your marketing suggestions together. Acceptance by your company is much like acceptance by a commercial publisher. Make your case with care. Be sure you can live with what develops. If you are trusted and fail, you may not get a second chance.

4. PUBLICATIONS FOR STUDENTS: How to market know-how to classes. If you are a teacher for group instruction, you have some unique opportunities. An adult education course in a school or in a company enables you to try out small samples of your book experimentally. A chapter handout can convey far more than your students could capture by notetaking on what you say. Their feedback about it, whether by discussion or in written form, can add refinements. Even the mere OUTLINE for a book or chapter you hope to write may be more helpful in handout form than in a lecture. The feedback from it may help you to shape the finished manuscript. Class members can become content enriched resources while also serving as data sources in a market survey for your eventual book.

5. AUTHOR SUBSIDY: Whether to help to finance publication. Much fine professional authorship is done without royalties, fees, or even reimbursement of typing costs. Some journals pay a token fee for articles, but many do not. A few even charge you for space they allot to you. Your recompense is in the professional status you gain, or in the progress your article makes possible in your mission. Recognition as an expert can be worth far more financially in career advancement than what you invested in publication. If your book gets you a 50% increase in salary, your subsidy is well justified. Publication in some specialties, especially in NEW ones, may justify some subsidy.

6. AUTHOR AS PUBLISHER: Whether to assume the role of distributor. Think twice before you become a retail merchant for the book you write. Without some recognized institutional sponsor your work may be handicapped. Your university's sponsorship of the QUALITY of your work is a major asset. You need that aid to credibility, even if the university can't finance the publication. More important is the secretarial and operational load you assume as a retailer. Demands on your time for transactional details and snarls may interfere with your professional career. Your university bookstore may be better able than you to handle the transactions. A consignment arrangement may relieve you of the chores which you need to avoid for professional reasons.

7. "VANITY PRESS": How to avoid a rip-off. You can get almost anything printed by a few "publishers" if you foot the bill. This goes for poetry, music, or your grandfather's autobiography. Your manuscript is "reviewed" and found to have "merit." You pay enough to cover all costs plus good profits. There may or may not be some promotion, marketing effort, or "royalties." The vanity press operators cover a wide range in both ethics and competence. They are not primarily concerned with the type of productivity improvement discussed in this book.

C. PRODUCTION PROCESSES

How to get your copy set up and printed

Technology is changing so fast that this section may be obsolete before you read it. For that reason it is brief and general.

1. TYPESETTING: How to achieve camera ready copy. You have several choices about creation of printable pages: a) Type it or have it typed ready for photographing. b) Have it done by word processing. c) Have it typeset by computerized typesetting equipment. The first two are likely to have a TYPEWRITTEN appearance. The third may look more like a BOOK. It also offers more selectivity about type faces and other appearance factors. As you move up the scale of equipment complexity, you become more dependent on others for copy set-up, paste-up, and refinement. This dependency may add cost but release you for far more important activities.

The electronic features make revisions easier. That may tempt you to do first drafts with less care. Your own refinements are far easier to make while still on slips than on pages. But page proofs have the great advantage of permitting others to suggest refinements. If you open that door too wide, the result may resemble the "camel that was designed by a committee."

Some features that are good to have but not possible with some equipment are:

- a Justifying (evening up) right ends of lines.
- b Dividing long words that would more than fill the lines.
- c Getting more letters per inch along the line than typewriters normally permit.
- d Proportional spacing (the letter i takes less line length than the letter m, for example).
- e "Book" appearance of the type face.
- f Double columns (to make it easier for the eye to find the next line on the return sweep).

A major cost factor is the number of letters per line inch. Ten-pitch typing uses 20% more line space and pages than 12-pitch does, hence 20% more printing cost. Typical book type is 10-point (not 10-pitch) type on a 12-point base. This gives you about 16 characters per line inch, plus better appearance and readability. It cuts the printing cost accordingly below that of 10-pitch or 12-pitch typing or word processing.

2. PROOFREADING: How to correct the errors.

Your proof sheets will be imperfect in two ways: a) Typesetting errors made by the typist or operator. b) Author errors you failed to correct before it was set up. Author changes are usually charged extra. In either case, an error is an error and does you no credit if left in. You can read and reread many times and still see what **SHOULD** be there instead of what **IS** there. A time interval between readings can help you to catch some of these but not all. Some of these can reverse or alter meanings in critical or even catastrophic ways. One of the space launches was delayed a long time by a single wrong character in the computer program. You may need some professional help to proofread some of your material. But only **YOU** can catch some of the errors.

3. PRINTERS: How to get your printing done.

Printing bids, and quality of printing from your camera ready pages, can vary enormously. The top bid may be three times as high as the lowest. So may be the quality of the printing or the service you get. And the quality or service may have no fixed relation to the bid price. You may be poorly qualified to predict what you are about to get, or to protect yourself if results are not good.

Big publishing firms, companies, universities, or government agencies contract for a great deal of their printing. They have some experiences about prices and quality that can help you. Even if your own employers can't be your publisher, they might help you materially in making a selection.

6PT. COPPERPLATE NO. 3 MEDIUM ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 6PT. COPPERPLATE NO. 4 LIGHT ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 6PT. COPPERPLATE NO. 4 MEDIUM ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 12PT. COPPERPLATE NO. 2 LIGHT ABCDEFGHIJ1234567890
 12PT. COPPERPLATE NO. 2 MEDIUM ABCDEFGHIJ1234567890
 8PT. OPTIMA LIGHT ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 8PT. OPTIMA BOLD ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 10PT. OPTIMA LIGHT ABCDEFGHIJKLMNOPabcdefghijklmnopqrstuvwxyz1234567890
 10PT. OPTIMA BOLD ABCDEFGHIJKLMNOPabcdefghijklmnopqrstuvwxyz1234567890
 8PT. GARAMOND ROMAN ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 8PT. GARAMOND ITALIC ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 8PT. GARAMOND SMALL CAPS ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
 10PT. GARAMOND ROMAN ABCDEFGHIJKLMNOPabcdefghijklmnopqrstuvwxyz1234567890
 10PT. GARAMOND ITALIC ABCDEFGHIJKLMNOPabcdefghijklmnopqrstuvwxyz1234567890
 10PT. GARAMOND SMALL CAPS ABCDEFGHIJKLMNOPabcdefghijklmnopqrstuvwxyz1234567890

CHAPTER 14. NON-PRINTED PUBLICATION

HOW TO MULTIPLY KNOW-HOW BY THE NEW TECHNOLOGIES

New optical and electronic technologies are revolutionizing communication and work improvement. Who knows what fiber optics, lasers, infra-red, ultrasound, and micro-what-nots may do in the next ten years? The same principles of analysis, organization, authorship, instruction, and printed publication which we have discussed may still apply but need adaptations to the new means of reaching out. In this chapter we suggest some of these adaptations. Our main focus, however, is on the new technologies and processes for reaching more people. The rate of change is so fast that we touch only a few high spots.

A. MICROFICHE

How to distribute pages in condensed space

1. Microfiche retrieval. You can get all 64 pages of our 1983 book on a piece of plastic little larger than your hand. You might call this a "micro-optic advance." It is a new way to get a book out of a library. The Defense Logistics Service Information Exchange (DLSIE) can mail it to subscribers who write or telephone for it.

2. Microfiche reading. If you get our microfiche, you will need to go where there is equipment to read it, and know-how to operate that equipment. You will see the pages as they come on the viewing screen. Reading time may be scheduled on a priority basis. You may be charged by the hour, as at a laundrymat. Obviously this is not an easy way. But for some people it may be the only way to do it **FAST**.

3. Electronic printouts. Your reading site may or may not have a printer. It may or may not be in order, or available when you need it. More likely you may need to have the microfiche sent elsewhere for printing. That may or may not get done in a week. It may cost you 25¢ per page or more, say \$17.00 for our 64 pages and cover sheets. Our book costs only \$3.00.

B. TECHNOLOGICAL DRAGNET

How to collect content for the new outlets

1. New ways of targeting. When "Dear Abby" wanted to start publishing letters about problems of aging, she ran a call for them in her newspaper column. She soon got over 50,000 letters asking her advice to older people, or to younger ones about their elderly relatives. She answered some the best way she could. She soon got back a treasure of better advice from her readers. Professional journals do a similar targeting for "Letters to the Editor." Program chairmen may get similar suggestions for speakers or topics for future meetings. Federal funding agencies invite proposals for research or training grants. If you want to distribute know-how, you need some such way to **GET** it.

2. "Reverse publication." Typical publication conveys know-how from one source to many. Your dragnet for content reverses that flow for the moment. You become the reader of bits and pieces that come from many individual "publishers." What you collect becomes substantial content for the more typical transfer from a central publishing source. Recent electronic advances can make that two-way transfer far more fruitful.

3. Workshop by telephone. Fifty Air Force experts met at Albuquerque to improve a critical Air Force activity. Demidovich had 90 minutes of their time. He worked from Dayton, Ohio, by telephone WATS line. A major had slips cut up at Albuquerque. He served as an assistant in the room. Demidovich gave directions and targeting by telephone. The major collected, sealed, and mailed the slips to Crawford in California for processing into a feedback synthesis. That is just one case example of the PRE-COMPUTER role of the Crawford slip method of "dragnetting" for content. We got thousands of excellent slips in those 90 minutes. Can typical conventional methods match that? Can electronic dragnetting match it? We challenge you to try to make that possible.

C. CONTENT QUALITY

How to upgrade what goes out in new ways

1. The danger of superficiality. "Computers make it all very easy" is a bit too optimistic. Don't start punching keys too soon. Quick-and-easy may be quick-and-dirty generalities that discredit you. Solid substance and precise content require more. What goes to large numbers merits great care, and possibly more cost. Impulsive and improvised content can damage you as it does a diplomat.

2. Authorship before electronics. Computers can't think, yet. Overenthusiastic computer fans may substitute keypunching for thought. Sentences go on diskettes in a sequence about like slip writing. Rearranging them from diskettes is not as easy as by moving slips. You had better learn how to write manually, by handwriting on slips, before you try it the computerized way. An evangelist who reaches thousands or millions had better write the sermon before going on the air. What goes to future audiences by videotape had better be good. If it is not, don't blame the hardware. "Where's the script?" is a legitimate question.

3. Organization is important. There is more to architecture than driving nails, and more to authorship than forming sentences. Classifying and connecting the sentences is the most difficult part of applied authorship. That is the ARCHITECTURAL function which the computer is less able to do. The analogy to house building applies. It is far easier to rearrange a floor plan before than after the walls are up. The well publicized freedom to revise a paragraph may tempt you to undue carelessness about reorganizing pages. When you try

that, the difficulty may tempt you to go ahead with a substandard manuscript.

4. A second opinion is important. A "halitosis friend" may tell you if your message is not right. Your sentences may not mean to others what they do to you. Your highly technical jargon may need stepping down several notches. Publishers pass a manuscript through the hands of several reviewers. Language details of spelling, capitalization, punctuation, and grammar need to be both correct and consistent throughout. Those language details are mere carpentry. But they can discredit you nevertheless. If you can't do them right, by all means beg or pay someone who can. But the over-all architecture of your message requires editorial review from a higher professional level.

5. Staff writing may be necessary. Some magazines are almost entirely staff written. Often no one person knows all the angles or aspects needed. Some who do know may lack the authorship skill to do it well. Technical and professional specialists are often not as expert in authorship. Even if they are, they may lack insights about the needs and interest of the intended learner audiences. Also they may lack awareness of some electronic constraints in the chosen medium. You may benefit yourself and your learners by letting the editors make your message over for you. But do your very best first.

D. BROADCASTING

How to publish by radio or TV

1. Universal needs. Can you do something well that everybody else needs to learn how to do better? If so, you can reach many people by broadcasting your know-how. Even if you don't know the whole answer, can you compile and broadcast a progress report toward it? The broadcast hardware and organization are there for you. Your challenge is to collect enough sound content to justify your time on the air. Your general public learners may not be ready for your graduate level technical jargon. They may turn you off if you don't come to the point about what they need to learn. The station can't use you if you drive their listeners or viewers away. You need popular appeal in addition to academic and practical substance.

2. Need to prepare your message. In the early days of radio and TV the stations took some long chances on live speakers or performers. Pre-recording is more common now. You have even more reason than the station people to protect against your stumbles or blunders. Spur-of-the-moment wordings of sentences can damage your professional reputation. The one sentence, "I was brainwashed," is thought to have ruined George Romney's campaign for the presidency. Yet writing a speech and reading it like a 10-year-old may turn voters or listeners against you. How to combine a sound and instructive message with spontaneity and naturalness is a major challenge.

3. Playbacks of recordings. Recording and playing

back an actual speech can do wonders for your future ones. You and others can spot the flaws, and also the features that went over well. Such a critique of today's speech can improve tomorrow's.

4. Authorship by speech making. Many of Winston Churchill's fine books are largely edited excerpts from his speeches of former years. Recording your speeches is one way to "dictate" for publication. The informality and naturalness of the audience relationship carries over into the book. The problem of MERGING the excerpts into organized instructional configurations is a major challenge. We hope some computer genius can devise a technology to reduce that spoken treasure to slips that can be classified for textbooks or manuals.

E. TECHNOLOGICAL INSTRUCTION

How to teach by broadcasts or recordings

1. Classes by TV at USC. Closed circuit TV has been used for years for prizefights or teaching of grammar. The School of Engineering at USC is one of 24 major universities that give credit for instruction by TV. As you read about it you will see many ways it could be used in other fields than engineering. This highly developed program is so significant that most of this section will spell out details of its main features. How might YOU adapt it to YOUR situation?

2. Transmission process. Four transmitter studios on the USC campus can broadcast simultaneously on four closed circuit channels. Each is a large classroom for live instruction in addition to transmission to remote classrooms. A control room is at the back of each classroom. Three cameras record continuously, two horizontally and one from above. What the instructor writes or draws is transmitted from the camera above. Each student in this and the remote classrooms has a monitor instrument. It shows close up what the camera sees. A talk-back capability exists at each desk in all the classrooms. A student can ask the instructor a question, and all can hear the reply.

3. Reception process. About 30 client companies are receiving courses from the four studios. The reception radius is about 30 miles from the Hollywood Hills. Each company has a coordinator who handles students' problems of attendance and relations with USC. Company classrooms are equipped for continuous use according to schedules. Additionally there are mobile classrooms for client companies that need them. Size of remote classes varies from very small to large according to needs and nature of courses.

4. Quality assurance. Instructors and their department heads are responsible for the quality of content and delivery, as in campus courses. Handouts go by courier to remote classrooms. Couriers pick up student homework for delivery to the instructor. Such papers are evaluated as if they came from campus classrooms. There is also some polling of students' reactions to the broadcasts. There are some analogies to correspon-

dence study, but closer resemblance to typical classrooms.

5. Air Force "Teleteach." The Air Force has "Teleteach" classrooms at many bases around the nation. Each seats about 25 students. An instructor can transmit from any base to the others in the network. There is an electronic blackboard. Otherwise the instruction is audio only. Any student can ask a question. It and the reply can be heard by all. How much of this plan can you use for your situation?

6. Courses by recordings. Audiocassettes and videotapes make possible the perpetuation of a good lesson with great flexibility of time and place. A truly first rate instructor can become a major national resource. Such basic quality of output can compensate for some of the loss of "live" instruction. Videotapes are especially good for conveying the personality of the instructor. The rental income from such recordings can motivate heavy investment in quality. This just might become the "wave of the future" in our quest for better applied instruction.

7. Learning centers. Retailing of live instruction to small classes is not very economical. If recorded instruction can reach needed quality standards, the potential is enormous. Individuals can learn in the home, or as part time employees. Class size is immaterial. A replay mechanism can give the learner a second chance at what is not grasped the first time. What can YOUR creativity add to this dream, in YOUR field?

8. AMCEE. The 24 engineering schools of which USC is one, and which teach engineering by TV, are in a professional association. Its name is "Association for Media-based Continuing Education for Engineers, Inc." Its address is 225 North Avenue, NW, Atlanta, Ga 30332, Tel. 404-894-3362. It offers over 500 short or long videotaped courses. Some are for employees at lunch time. Some could substitute for speakers at professional conferences. Others are entire courses such as USC gives. What can your creativity do with this concept?

9. Video teleconferencing. Atlantic Richfield Corporation (ARCO) has one of the most advanced video teleconferencing systems today. They own their own satellite. They conduct conferences between Alaska and Los Angeles where all participants can see each other on large TV screens. Other ARCO centers around the country are on the network. They call their system "ARCOVISION." If a document needs transmission, it can be beamed up through a datafax linkage. Many government, military, and industry people are studying how video teleconferencing might justify costs.

F. TECHNOLOGICAL NETWORKING

How to share information through clearinghouse networks

The computer explosion has magnified the need for central data bases and networks. The networks have

mushroomed astronomically. Each has its special mission and field of effort. The rate of change is so fast that we are not trying to document the details of them.

1. Libraries. Larger libraries are rapidly adding electronic means of sharing documents of many kinds. Some university students can search by computers instead of card catalogs. Some computers can do library searches 24 hours of the day. Some can search in distant libraries, even in other nations. Searching for specific answers to specific questions may be less easy than bibliographical searching.

2. Defense networks. The navy can direct and coordinate ships and operations all over the world by its computer network. The Air Force Logistics Command has its network for supplies and maintenance all over the world. The R & D laboratories share technical research findings through a variety of special networks or clearinghouses. These have their special purposes and constraints. The dream of uniting all such overlapping clearinghouses and networks into one compatible system is a major challenge. How might YOU help to make that dream a reality?

3. Civilian networks. ARPANET is a network of 50 universities and research institutions, including a few in Europe. The Reader's Digest and the Control Data Corporation own an information network called "THE SOURCE." It is gaining momentum fast. It can send requested information by electronic mail. Dialog Information Services, Inc., is a subsidiary of Lockheed Corporation. Its January 1984 "Database Catalog" is 54 pages of what you can retrieve, and prices per hour of connection time.

4. Local networks. The term "networks unlimited" might describe the infinite number and kinds of networks within and between individual companies or agencies. These local networks have to interact with other local or national ones. There is hectic competition for posture and profit in that competition. Having broken up our telephone system, who knows what will happen next?

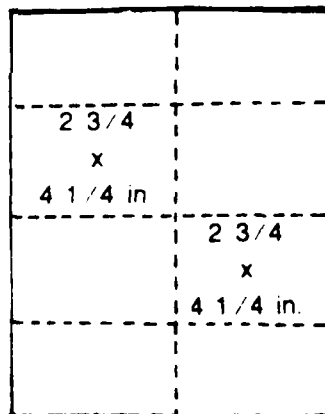
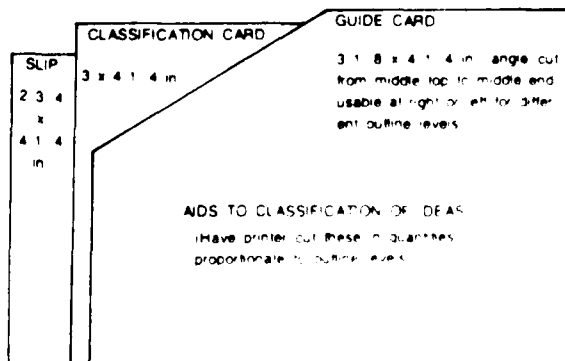
5. Working at home. A recent spin-off from the local networks is "Telecommuting," or working at home instead of the central company office. Travel time, office space, and schedule factors are involved. Start thinking now about troubles and remedies that will be important when this idea comes up in your organization.

6. Clearinghouse problems. The central data bases all have in common the problem of INTAKE. They can't share what they don't have. What is known somewhere could be very valuable somewhere else. But how do you get what is really wanted and needed? How do you avoid wasting your effort storing JUNK? And who decides what is junk? And how do you protect SECURITY of what is of tremendous value but unsafe in wrong hands? Truly the network idea offers plenty of room for all the creativity you can muster.

7. Crawford slip method as a network tool. Network data bases need ORGANIZED know-how. Miscellaneous bits and pieces are not good enough. The Crawford slip method can help you to collect and organize the bits and pieces into learnable configurations. This PRE-COMPUTER service to the networks is urgently needed. Some of us at USC are working toward a "USC THINK TANK" to add that missing component. That effort is treated in more detail in Chapter 17 of this book.

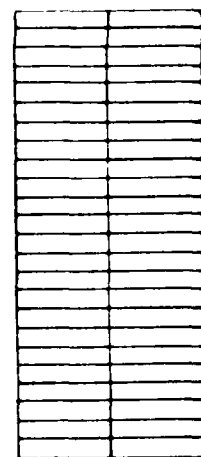
OPERATIONAL EXHIBITS

Reprint for separate use as paste-ups or projections

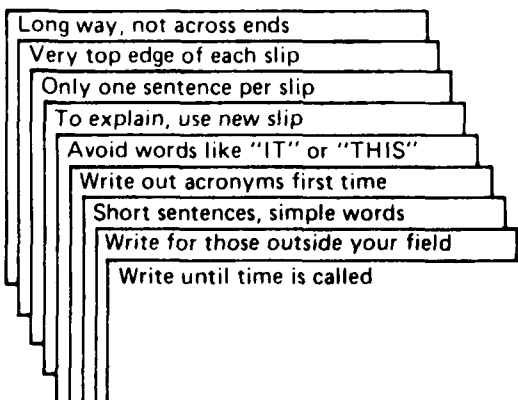


Cutting pattern for slips

(For printer, not office cutter, from 20 pound bond paper, 8 1/2 x 11 in.)



48 slot classification tray Lay six side by side for big jobs



TOP VIEW OF SLIP FILE BOX WITH SMALL BOX GLUED INSIDE FOR STOPS

PART V. IMPLEMENTATION

How to get know-how used productively

Supervisors deal with individuals, managers with systems. Higher levels of management tend to be generalists. They delegate specifics to lower down. Eventually somebody must DO what is delegated. What you write and publish can become DATA for several kinds of IMPLEMENTERS: a) Supervisors. b) Managers. c) Planners. d) Analysts, authors, instructors, and researchers who assist any of these as needed. Part V gives some starter thoughts about how you may help them.

CHAPTER 15. SUPERVISION HOW TO INDIVIDUALIZE KNOW-HOW APPLICATIONS

As a supervisor you are both an instructor and a manager. You teach individuals how to do tasks. You apply line authority over them as employees. You operate systems of paperwork, transactions, and interactions to keep your part of the total mission going well. In theory your instructor and manager roles are about equal. In practice they are often lopsided because management crowds out instruction. Our workshop slips tell us our nation pays a high price for this lopsidedness. This chapter deals with the supervisor's INSTRUCTIONAL role. Roles in control and management will follow.

A. CURRENT SHORTCOMINGS

Wished-for changes in on-the-job-training

1. Supervisors want help to improve their performance. A large workshop audience of repair shop supervisors wrote slips on help they needed in their supervisory roles. Their complaints are very typical of what we get in other kinds of work. The following key words from their cries for help deserve attention: Hard to direct what I can't DO; can't teach what you don't know; can't be expert in all tasks we direct; can't know the work well enough to supervise it; more than I am capable of; lack of confidence in self; look like a dummy to subordinates; workers have low opinions of us supervisors; unable to read technical orders; lack of troubleshooting skill; technical but not supervisory knowledge; not enough technical knowledge; lack of job knowledge; supervising without job experience or supervisory experience; inadequate training; training received was of little use; manuals not very directive; no help from supervisor I replaced; left up to me to learn how; got information in my own way; little feedback on my performance; got little criticism; didn't know what I was doing wrong until too late.

2. A systematic DESIGN for on-the-job instruction is wished for. A 300-supervisor workshop audience in a large city FOREMEN'S CLUB wrote slips on supervisory troubles and remedies. Their troubles matched those

from the repair shop supervisors almost exactly. They were frank, anonymous, and uncensored inputs by their chains of command. Their responses might differ if asked by the boss face to face. Their answers about remedies are reported in the rest of this chapter. Here is a sample of those related to the need for a SYSTEM for the instructing: training based on a SYSTEM; not spur-of-the-moment improvising; learning from peers is not good enough; experienced ones don't transmit what they learned; systematic method of procedure needed; systematic presentation of right ways; structured learning; consistent; relate training to specific tasks; teach by priorities of importance; teach high priority tasks first; design for learning that specific task; individualize to fit each person; one-to-one; get out of office; get where the work is being done.

3. "RIGHT WAYS" of doing tasks are wished for.

The following samples illustrate what came in about better ways: Don't just let each do it in own way; beginners are unlikely to discover the best way; decide HOW tasks should be done; guard against passing on WRONG ways; be sure directions are correct; settle on BEST WAYS for tasks; agree on and ESTABLISH the right ways to do tasks; combine judgments of skilled ones to come up with standard best way; decide on best ways and teach these; decide on right steps for individual tasks; agree on how to do it, then teach that way; standardize procedures; enforce the right way after teaching it.

4. DOCUMENTATION of the right ways is wished for.

Like a chorus those 300 supervisors left no doubt about their wishes for more know-how on paper. These few samples represent them all: More manuals; procedure manuals badly needed; printed instructions; put it in writing; printed for all; put the words on paper; leave it on paper after telling it; permanent reminders; oral transmission loses too much; they soon forget what you say; they half-way understand what they hear; what you say leaves no record; record what they heard and saw; printed matter to fall back on; something to read when confused; printing gives it to all uniformly; up-to-date printed matter; directions on paper for both worker and supervisor; printed directions handy at each work station; copy machines make training easier; they could train themselves if directions were printed; approved directions are good back-up for supervisors; printed standards easier to enforce.

5. TASK BREAKDOWNS to step-by-step checklists would be a big help.

Far fewer slips mentioned the need for TASK BREAKDOWNS and STEP-BY-STEP CHECKLISTS as instructional aids. That vital heritage from the World War II JIT (Job Instructor Training) program has been almost entirely lost and forgotten. Please reread our chapter 5 for more about it. A step-by-step list of directions in the correct numbered sequence can be a powerful teaching and learning tool, equally helpful to worker and supervisor. It becomes an "assistant supervisor." It is a specific way to fulfill the more general wish for the DOCUMENTATION we have just reported.

B. PROPOSED SYSTEM*How to do one-to-one
supervisory instructions*

While there was a widespread wish for a SYSTEM, the slips we received dealt with PIECES rather than the CONFIGURATION. One person stressed motivation, another clear directions, others performance or evaluation. Collectively their inputs covered the whole jigsaw picture. The following paragraphs put the pieces into the wished-for configuration as used for the World War II JIT training program. Please reread Part II for the rationale of what now follows, most of which is in words of those 300 supervisors in the Foremen's Club.

1. MASTERY: Teach for correct and productive performance of the task. Unless the work has been done right, the way to do it has not been learned. The first goal is to learn correct performance. Right ways and right results become the expected standards and the evaluation criteria. The right result might come by accident, or by a process that was too slow, costly, unsafe, or wasteful of material. Correct process and result may be mastered first, with speed and economy to follow, but come they must or the learner is not MASTER of the task.

2. MOTIVATION: Create a real wish for mastery of the task. Those supervisors' motivation slips were long on the need but short on methods of motivating. Typical methods were: Put trainee at ease; relaxed atmosphere; take off your tie; atmosphere free from stress; friendly tone; reassure the discouraged. Only a few mentioned dramatizing the BENEFITS of mastery or the DISADVANTAGES of failure to achieve it.

This seeming blind spot about the basic psychology of salesmanship as a part of training shows up in the slips from our other workshops, for people of all levels in many kinds of activity. We refer you back to our motivation chapter for more on this. Unless you learn how to SELL mastery of the task, you are stopped at the starting line.

3. DIRECTIONS AND EXPLANATIONS: Show and tell how to do the task. Almost any method of presenting directions is better than the much-complained-of lack of any guidance at all. The goal for this phase of instruction is INSIGHT or CATCHING ON. A good start is to SHOW how. Telling as you show, or "talking it through" as you demonstrate, is a big help. Answering the learner's questions as they arise can "strike while the iron is hot." Giving the REASONS adds enormously to both insight and motivation. Simplicity of language drew many slips, as did asking and testing for proof of understanding. But the real proof of understanding comes when the learner actually performs the task. The slips about directions did not go much beyond "Give them." See our Chapter 7 for more on the rationale for this step.

4. TRIAL PERFORMANCE: Have the learner try to do the task. Many of the slips that touched on this phase

of OJT did so in more of a WISHFUL than a DIRECTIVE way. They seemed to be thinking of the instruction as being in a classroom instead of at an individual's work station. In fact the very term "on-the-job training" seemed to be generally thought of as "in a class after being hired," not one-to-one at the work station. There were slips wishing for "some actual HANDS ON training if possible." Other wordings for this less-than-optimistic wish were: A little exposure to actual work; some actual practice if possible.

In contrast with this blind spot are such insightful wordings as: Allow time to practice; take them through each step at least once, don't rely solely on the DOING as the whole of learning; alternate explanations and practice; reinstruct after work exposure; have them do some work and then teach again. Those few people were really thinking of one-to-one individual instruction. See our Chapter 8 for more on this.

5. CRITIQUES: Give specific feedback about successes and failures. "DO IT" got many slip inputs in this feedback category. Those supervisors were right on target on this evaluation phase of OJT. Sample wordings were: Monitor progress; constantly check progress; stay with the trainee for a while; one-to-one; check actual performance; evaluate actual skills; inspect what they turn out; see how they do it.

Other slips went into detail about what to check or how to do evaluations. Some examples: Test for insights learned; verify that you were understood; ask questions to check understanding; check quality of output and process used in achieving it; head off errors before they happen; check on mistakes; check on SCRAP they produced.

Others would involve learners in their own self-evaluations. Some examples: Get trainees to analyze and evaluate their own performance; ask learners' opinions of their own performance; ask them what they have trouble with; check trainees' self-evaluations and correct any errors in them.

Sample slips on instructor feedback: Instant feedback; recognize successes; correct their mistakes; point out weak points; correct serious mistakes first; praise more than you blame; explain how and why the problem arose; teach and reteach until they master it. See Chapter 9 more on evaluation.

6. CONTROL AND ENFORCEMENT: See that work is actually DONE right. Faulty work may be mere ERROR while learning. After mastery is achieved, error may be MISCONDUCT. More charitably it may be mere CARELESSNESS, or possibly OVERSIGHT. In any case the supervisor has a line authority responsibility to get it done right. Control, discipline, and enforcement will be dealt with further in the next chapter as a manager role.

CHAPTER 16. MANAGER ROLES HOW TO SUPPORT THE IMPROVEMENT PROCESS

The processes we have described in this book need manager help. This chapter spells out that help. It is addressed to the managers and also the analysts, authors, and change agents who need the help.

But that help is a two-way street. Managers also need help, not only from the "improvers" but from all in the organization. They need better access to the know-how of people closest to tasks. A vast resource of wisdom about productivity is theirs for the asking. It is attainable by methods we have described. Available wisdom is fragmented, with pieces bottled up in individual brains. Wisdom usually reaches managers by haphazard "trickle-in" methods, if at all. We have presented methods to change that trickle into a flood, and the fragments into a configuration. This chapter outlines managers' roles in that process.

A. SYSTEMS ANALYSIS

How to aid the author-analysts

The BIG PICTURE of a mission or enterprise is a mosaic of many smaller pieces, each in somebody's brain. Some pieces may be faulty, inefficient, malfunctioning, or wrongly fitted in. The systems analysis process we have described can identify, scrutinize, and integrate the pieces. Managers can assist that analysis in such ways as follow.

1. DIAGNOSIS: Authorize and support a needs assessment. An enterprise or mission may need the equivalent of a patient's general physical examination, and a diagnosis of specific pains or illnesses. We hope the previous chapters have evidenced a credible way to make such a needs assessment. The challenge to the author-analyst is to become COMPETENT to apply the Crawford slip method for that purpose.

2. WORKSHOPS: Authorize and support group meetings for slip writing. Employees who are writing slips in a workshop are away from desks or work stations. Salaries and wages are being paid. Schedules may be affected in many places. The workshop leader needs help and support, possibly from several managers.

3. MEETINGS: Convert some talk sessions to slip writing. Meetings consume vast amounts of time. Salaries and wages for them add up. Our slips by thousands complain of wasted time in meetings. Managers who call them are trying to get others' know-how but are getting relatively little. Much time goes to "junk talk" by an assertive few. The silent ones take their know-how back with them along with their regrets about the time they lost.

Once all have learned how to write slips, this can change drastically. The manager can present the problem or issue as a target. Each person can write pertinent know-how slips. Five or ten slips from each may come from five or ten minutes of writing time. Such

"quickie" workshops can cut loss of production time. The manager gets more input from more vantage points. If the problem is complex, this can be done for each subproblem. The slips are INDEPENDENT even if not anonymous and private.

4. PRIVACY OF RESPONSE: Provide safe ways to present criticisms. Fear that handwritings may be recognized can inhibit some badly needed inputs. Managers often underestimate that inhibition. If privacy of response is promised, that promise should be kept. Slip writers must BELIEVE it will be kept.

Processing slips outside the chain of command is not always feasible. Time factors may require immediate access to them by managers and their helpers. That is well illustrated by the "quickie" workshops we have described. In such cases the slip writers need to be told before they write. INDEPENDENCE of response is still obtained.

5. BUZZ: Combine slip writing with oral exchange. The brainstormers had a point. People do like to talk. They can build on each others' ideas. But they can generate infinitely more and better ideas by the Crawford slip method. Their warm-up slips give each something worth saying. The three-person buzz as "committees of advisors" puts the talking on a higher level. The sum-up slips as "committees of one" get more mature conclusions from each. And all those ideas are ON RECORD and LOOSELEAF. That beats the slow dribble of "junk talk" in group discussions.

6. ANALYST DEVELOPMENT: Train author-analysts for their improver roles. An ongoing enterprise has an ongoing need for diagnostic, remedial, and instructional functions, just as a community has an ongoing need for doctors and auto repair people. A team of trouble shooters can justify itself if it can really diagnose and remedy the troubles. The Crawford slip method can be a good technology for such a team. But it must be LEARNED, for the same reasons doctors or auto mechanics must learn their professions. A manager can't create such a team by merely APPOINTING its members. Neither brain surgery, heart by-pass, nor the Crawford slip method can be learned in a day. Our next chapter will deal more fully with the problem of creating a think tank capability for the productivity function.

B. SYSTEMS INTEGRATION

How to unify the fragments of effort

Managers need a lot of gravitational pull to hold the planetary efforts in orbit. Each unit has a great deal of centrifugal force to fly off on a tangent. And, like a tree, an organization can grow in all of its branches. The branches compete for sunlight and nourishment. Sunlight differences can make a tree lopsided. Pruning can correct the lopsidedness. What is the truly best configuration for your organization? Analysts work within the over-all perspectives of managers in finding the answer. This section presents ways generalists can aid the

analysts who try to help them.

1. WHOLENESS: Unify the system. The whole mission is greater than the sum of its parts. The difference lies in how the parts fit together in one dynamic action pattern. The subsystems tend to compete or jockey for roles and room for growth. Managers regulate that competition for roles and resources. They can stimulate or restrain. Analysts may alert them to opportunities or warn of dangers. Managers weigh, balance, decide, and authorize. Otherwise some parts might become overgrown cancers while others die out or are crowded out. Managers are responsible for the total organism.

2. STABILITY: Safeguard consistency and continuity. Invest enough in analysis to stabilize troublesome functions. Move away from case-by-case improvising to principles and policies that cover many cases. Define goals, standards, and expectations. Document and publish these expectations so all can work by them. Analysts may draft and recommend the standards for managers to review before adoption.

3. JURISDICTIONAL UMBRELLA: Regulate interactions between the parts. If each unit does its own thing, there are too many collisions where their paths intersect. Without some help from above, anarchy reigns. Analysts can identify the collision points. They can help those concerned to write the procedures to stop the collisions. Managers can authorize the workshops for that procedure writing. They can be in those workshops, to involve their own perspectives about procedures drafted by those closest to the activities. This joint involvement can create an equivalent of the motor vehicle code. It can help all to work safely and productively.

4. CONFLICT RESOLUTION: Mediate and settle controversies. When Montgomery and Patton each wanted to spearhead the thrust into Germany, Eisenhower and his staff had to decide. That decision required analyses of resources and other factors unknown to Patton or Montgomery. Eisenhower performed the umbrella function. Unit leaders who don't speak to each other in your organization need such an umbrella. Without it decisions may be chaotic. Managers' decisions need to be based on analyses, and also be correct. They can be more acceptable to all if so founded. Interdisciplinary involvement in the analysis aids both correctness and acceptance.

5. FIX-IT FUNCTION: Remedy specific troubles. Organizations, like people, get sick or suffer pain in their specific subsystems. The analysts can play a role like that of a hospital emergency center. Hot spots can be analyzed quickly if the people are accustomed to slip writing. Sudden political, economic, or physical events may create crises. Managers need the analysts to mobilize the specifics of troubles and options. "Tiger teams" can work around the clock if the situation is like Three Mile Island. But there must be some "Tigers" ready to spring into action.

Less dramatic but still vital are some non-crisis needs for a think tank in being. Slow moving forces may be driving an organization toward bankruptcy or extinction. Rising costs or loss of markets may be very gradual. Morale may be declining, accidents increasing, quality deteriorating, litigation more threatening. An equivalent of the annual medical examination may be needed. The analyst team, like the family doctor, cumulates remedial know-how for better diagnosis of these slow trends as well as for specific crises.

6. PENETRATION: Learn more about the particulars involved. Napoleon's overlooking of a sunken road was a big factor in his loss at Waterloo. Managers may be too busy to inform themselves and prevent such oversights. Conversations and meetings provide the information too slowly and meagerly. The think tank team can do it faster and better. The Crawford slip method is like an x-ray that penetrates into activities that are otherwise "opaque." Such penetration can save time the managers would otherwise spend putting out fires.

C. SYSTEMS OPERATION

How to follow through

Think tank analysts are staff helpers. Managers are line authorities, responsible for actions. What follows deals with those actions.

1. COMMITMENT: Take responsibility for decisions made. Harry Truman's desk had a sign, "THE BUCK STOPS HERE." Truman was from Missouri, where people want to be shown. Managers also want to be shown. They owe analysts a careful look at what the analyses show. If analysts erred, the error becomes a manager error if it is accepted blindly. Managers' time saved by analysts' penetration into the particulars could justify a lot of time in examining the analysts' findings. Such scrutiny and thorough understanding can provide a firm basis for commitment to the actions that follow.

There may still be many unknowns or dilemmas. Managers seldom have the luxury of perfect certainty. "Paralysis from perfectionism" can kill an enterprise. There is plenty of need for courage after the best possible penetration is achieved. Managers are chosen in part for courage. But courage without penetration can repeat Napoleon's Waterloo mistake.

2. PUBLICATION: Make the new ways known. Personnel can't read manager's minds. They can read a new policy statement, training manual, or procedures guide. Our workshop slips by thousands complain of working in the dark about managers' goals and expectations. What analysts write for managers can be equally helpful for personnel. A copy machine can be a major asset in getting new ways into practice. A fuller understanding of the enterprise helps all to work together.

3. SALESMANSHIP: Sell the new ways to personnel. Employees are from Missouri too, especially about whatever upsets their accustomed ways. Managers vary in their willingness to ORDER them to change. Morale

suffers when change is done autocratically. The analyses that help managers can help personnel to accept the changes. Ideas from workshop slips can be good peer salesmanship for others who did not attend. Managers need all such help they can get for some new programs.

4. QUALITY ASSURANCE: Apply pressure for compliance with standards. About 60 quality assurance people wrote slips for a workshop at the headquarters of a financial institution. Their work was largely paper work for transactions with huge financial stakes. Following are key words for CATEGORIES for far more specific suggestions on how to get that paper work done RIGHT: Accounts, audits, checklists, computers, doublechecks, error rate statistics, experts for some tasks, feedback about errors, inspection, monitoring files and calls, disciplinary actions, over-all reasonableness, sampling, standardization, training, and work measurement.

5. CONTROL: Make some changes automatic or mandatory. Publishing, explaining, and selling the new ways may still not get full compliance by all. Some may not understand. Some forget. Some may lack the ability to comply. Some are overloaded and cut corners to keep up. Some are lazy and careless. Some are negative, antagonistic, disloyal, greedy, dishonest, or downright criminal.

Yet some tasks **MUST** be done right when you can't be sure who will let you down. Such tasks must be safeguarded against both human error and criminal intent. Locks, high fences, even concrete barricades, may be required. Electronic devices fill some of these needs. Robots may be needed for some things that can't be left to humans. Even the machines can malfunction, as humans do, and need back-up machines.

Judgmental errors are bad enough even when made honestly. They are doubly serious when made as camouflage for criminal intent. Two signatures may be needed on some papers. Crawford once received a check with 17 (yes, seventeen) signatures. How far must you go to safeguard against collusion or conspiracy? Numerous studies have shown that our government and our companies lose billions through frauds that are inadequately controlled. When you install a new system, new ways are invented to cheat it. Managers face the double challenge of installing a good system and protecting it.

6. ONGOING EVALUATION: Keep on improving the system. When a new battleship is completed, the shakedown cruise reveals some of its imperfections. Others emerge as its operations continue. A new plan or program in your organization follows a similar course. Each improvement prepares for the next, in a never ending upward spiral. Your think tank can start a new over-all diagnosis and improvement program as soon as it fixes up the hot spots in this one. Managers' support will be needed in ever more challenging productivity improvement programs.

CHAPTER 17. THINK TANK HOW TO INSTITUTIONALIZE KNOW-HOW TRANSFER

We recommend creation of a think tank network to coordinate the many individual efforts which this book will stimulate. We hope to create at the University of Southern California a think tank model which other large organizations may adapt to their needs. We write in the future tense with optimism that these hopes will become realities. This chapter presents highlights of this USC dream.

A. THINK TANK SERVICES

What to try to do

We visualize serving both individuals and the organizations in which they work. Here's how we will start.

1. Authorship instruction. A "Seminar on Applied Authorship" made a fine start toward a university credit course. This authorship instruction will be on the graduate level for faculty, staff, and graduate students at USC and elsewhere. This book and our 1983 book will be used as texts. Individuals will start writing their own hoped-for but long delayed books and articles. They will get critiques from each other on a mutual aid basis. Instructors will render over-all editorial guidance and consultation. Instruction will be aimed at a PUBLISHABLE and APPLIED manuscript from each individual.

2. Editorial assistance. The think tank editorial function needs to continue after the course in which a book project is begun. This need for editorial help becomes especially important in the final stages just before publication. Continuity is important. We visualize a continuous availability of qualified editorial personnel as a think tank feature. The course itself may turn out people to employ in such roles.

3. Coauthorship. The Crawford slip method makes coauthorship easy. One may be good at collecting slips, the other at processing them. Husband-and-wife coauthorships are often rich in values for each. The Demidovich-Crawford and the Krone-Crawford coauthorships have been very fruitful. Persons from different disciplines can enrich their copy by the interdisciplinary merger. A beginner in the Crawford slip method may get valuable editorial help from an experienced coauthor. Coauthorship with an established and well known expert can help a beginner in two ways: a) Quality assurance and credibility. b) Editorial assistance to get the copy up to the standard the expert can endorse.

4. Publication assistance. The 70 would-be authors in our seminar revealed a felt need for guidance on how to PUBLISH what they wrote. Our two chapters on this reveal some factors involved. The think tank will need to continue such help after the course gives initial assistance. The dream of a UNIVERSITY PRESS is a persistent one. Our focus on APPLIED authorship may make such a dream more realistic. Whatever USC may do in this

direction may point the way for publication outlets within other organizations. The whole world of publishing is in such rapid change that there is much room for creativity.

5. Productivity courses. Some client organizations may not be interested in authorship so much as in some special productivity problems. The think tank can be a resource for meeting such special requests for NEW COURSES FOR NEW NEEDS. The Crawford slip method makes creation of such tailor-made courses possible. The interdisciplinary authorship course can turn out qualified persons to meet many such requests for special contract courses. Such individually designed courses can often be given at the client organization's own site, since USC offers courses in many places in the United States and abroad.

6. The mid-career market for courses. The MID-CAREER employees are an especially important target for such productivity improvement courses. They will have gained valuable experience and advancement in rank and responsibility. They may have been promoted to what the Peter Principle calls their "level of incompetence." That term really means that they now face NEW roles in which they need help. Our rapid changes in technology and procedures have put many mid-career people in great need for NEW kinds of help. Courses such as PRESERVICE students get in the university may not meet this new mid-career need. Instructors who have learned the Crawford slip method can be called on for creating and offering one-of-a-kind courses to serve this purpose.

7. Procedure writing courses. Step-by-step procedures for tasks and interactions that cause most trouble are a major need in almost every organization. That need is not being very well met at present. The Crawford slip method for meeting it could become a major service rendered by the think tank. Since INTERACTIONS cause a major part of the need, the procedure writing course for an employer will require a good cross-section of the interacting personnel. The model presented in this book is well suited to such large cross-section groups, when applied by instructors who are well qualified in the process.

8. Other productivity services. Think tank services need not be limited to giving courses. The Crawford slip method has as many possible applications as a computer. Required are thoughtful and creative searches for those applications as experience grows. Well trained think tank personnel will be able to respond to a wide range of calls for help. The role of a "FIX-IT" resource can be as big as human creativity can make it.

9. "Research" services. Our think tank will feature systematic and large-scale collection and transfer of know-how. Much of it will be CURRICULUM RESEARCH. The term, RESEARCH, as used for grants and contracts, has many meanings. Most of our services would qualify under the following definition of research which we especially like. That is "SYSTEMATIC INVESTIGATION TO IMPROVE." Much of what we do was

once JOB ANALYSIS. A more recent term is SYSTEMS ANALYSIS. But we also do SYSTEMS DEVELOPMENT. The over-all role of the think tank will be PRODUCTIVITY IMPROVEMENT by whatever name you want to call it. Our think tank will feature systematic and large-scale collection and transfer of know-how.

B. METHODS

How to render think tank services

Our proposed think tank will operate by the Crawford slip method. There are already several well known think tanks operating in other ways. Let many flowers bloom. Ours will be our own special kind of garden. Our whole book describes it. This section merely summarizes the main features.

1. Applied. We will focus on USES and APPLICATIONS of know-how. Our services will be job oriented. A key word will be IMPROVEMENT. We will try to get more work done better with less. That is what we mean by PRODUCTIVITY.

2. Written. Oral handling of know-how is too slow and too limited to meet needs of our ultra-complex technologies and organizations. Oral transmission of know-how, instructions, or guidance has been increasingly ineffective. Writing can be useful preparation for speaking. It can capture and record vastly more of what is spoken when done by the Crawford slip method.

3. Anonymous. Much but not all slip writing may be anonymous, private, and protected from fear of reprisals if handwritings are recognizable. This is especially true for the first diagnostic stages where troubles and deficiencies are being identified. After these have been aired, the need for privacy of handwriting may be less. In the procedure writing stage the slips are critiqued by others and each set is SIGNED by those who wrote and agreed to their contents.

4. Specific. Depth of penetration into the specific refinements in performance will be a big think tank factor. There is far more to the Crawford slip method than the first ten slips that come off the top of each slip writer's brain. The rotation workshop goes one step deeper. Procedure writing can go far deeper than that. The analogy of the microscope compared to the electronic microscope applies. Slips from experts can penetrate deeper than those from learners, in the search for remedies. Writing slips to ever more precise targeting will produce hierarchies of know-how.

5. Catalytic. Our think tankers can serve as facilitators or catalysts to assist mutual aid among those being served. They need not pose as encyclopedias of answers to all questions asked. They can help those in the organization to make available to each other the know-how that is now bottled up in individual brains. They can be teachers of teachers. They can serve as editorial resources and SYSTEMS EXPERTS to mobilize and apply existing know-how to INVENT some that does not now exist.

6. Sometimes oral and written. The BUZZ workshop format can be a major catalytic tool. Writing to warm up the brains can enrich oral cross-fertilization. Sum-up slips can capture what develops in each one's brain after the oral buzz. By this means the client group can get numerous SIMULTANEOUS "quality circles" at one meeting. The leader of it all will have served in a role which the Japanese call "facilitator." That facilitator can then serve as an authorship instructor and editor to help the group process the insights they generated, or to generate still more.

7. New or unknown. Think tank services can be directed to what is UNKNOWN or simply what is unrecorded, unorganized, unavailable, or unrefined. What is unknown in one company or office may be well known somewhere else. But many problems or crises are in or near the "nobody knows" zone. Our role will then be as facilitator of the INVENTION of new know-how. Independently written slips from numerous "inventors" are likely to provide more creative options than come from wishing for a new Thomas Edison or Marconi. They can release a vast amount of creativity that is now going to waste. They can turn up hundreds of little new ideas that can suggest far bigger ones. Much of our existing technology came by small refinements instead of giant leaps or discoveries. The Crawford slip method is well suited for this INCREMENTAL role in innovation.

8. Stored for future use. Slips from one project become data for future ones. File boxes of uniform sizes can keep these for future uses. Each study or analysis can add to the data bank. Many of these boxes will accumulate at USC. Some will also be in central data banks or computer memories elsewhere. Others will remain with individuals who generated or processed them. Our rapidly developing electronic technologies will soon make possible a network of such central and peripheral data banks. More important may be the electronic transfer of the organized products from what is stored in the original boxes. Possibilities are almost infinite.

C. SALES AND MARKETING

How to sell think tank services

To exist and be self-supporting the think tank needs paying customers. Two kinds of markets need to be reached: a) Individuals. b) Organizations or institutions. How to reach these is dealt with next.

1. Individual customers. Recruitment of high-level professionals as practitioners of the Crawford slip method is the first marketing goal. That is equivalent to providing production machines and personnel in a factory. Authorship instruction is a first step toward the editorial capability which the think tank will require. Enrolling capable people in the authorship classes is a genuine sales challenge. We will be selling a new concept or product, unlike typical university courses that

are already established. Potential enrollees will need to be convinced that authorship and editorial skills are valuable and worth learning. They will need to be INSPIRED and DEDICATED to the productivity missions which this book has explained. They will need to become not only practitioners but also MULTIPLIERS of the Crawford slip method.

Applied authorship at present is a bit like an "endangered species" in our economy. The think tank needs the intellectual equivalent of biological REPRODUCTION. Our hope is to assemble more "breeding stock" to help applied authorship to recover. Survival and continuation of the think tank will depend on those multipliers. Recruitment must precede training them.

2. Institutional clients. Retailing the Crawford slip method to individuals is a slow and costly way to raise the productivity of our university, state, or nation. We will need mass production and wholesaling of both the concept and the capability. The first authorship course will be a model repeatable in many places. Those who come to it to learn may go away to teach, or join our central think tank team at USC to follow through as editorial consultants. We visualize newly trained team members teaching courses within large companies or agencies. A first course in a big organization may open the door for more specialized ones within departments.

A nucleus of USC instructors may well multiply such instruction in many large organizations, geographically dispersed. Such instructors, and their courses, must gain CREDIBILITY. Such credibility will require sound academic credentials plus proven capability in the Crawford slip method. New instructors can be added to the team as they prove themselves qualified for this special kind of teaching. Overselling of courses taught by unqualified instructors can make selling more difficult.

3. Associations as marketing resources. Large professional and trade associations can be gateways to the organizations from which their members come. Their monthly or annual meetings need speakers with unique messages. A diagnostic workshop at such an annual conference can teach more than a typical speech can. It can leave you with a fine collection of slips toward a course in that field. Other local chapter meetings may enable you to penetrate deeper. These analyses plus your own perspective as a professional in that field may qualify you for major service to that field of activity. What is begun for such an association or society might be followed up by specific applications within specific companies or agencies. The conference may be a good place to sell the Crawford slip method to individuals to whom you can then sell its more specific applications.

D. ADMINISTRATION

How to structure and operate the think tank

Following are ideas for our proposed USC think tank. Many of these might apply to other think tanks in a geographically dispersed network.

1. The Knez dream. Robert J. Knez, while Director of Automatic Data Processing at the Defense Technical Information Center, made a significant proposal. It was in an article in the DEFENSE MANAGEMENT JOURNAL, first quarter, 1983. The title was "Sharing Human Intelligence through a Computer Network." He called the proposed network "Consultants Anonymous." In the fifth paragraph he said, "The basis for Consultants Anonymous is the Crawford slip method." He suggested that people with computers might draw answers from other computer owners in the network. His DTIC (Defense Technical Information Center) is already a major clearinghouse for such exchange. Such a network theoretically could draw needed answers from any place on earth. We have had similar thoughts and want to make it a reality. Our proposed USC think tank can be a vital beginning.

2. The intake problem. A major need in any information clearinghouse is to get the information in so it can be sent out. Such a clearinghouse needs a CRITICAL MASS large enough to perpetuate itself. If needed answers are not forthcoming, people quit asking for them. At present much of America's technical and job know-how is bottled up in individual brains. Many of those who really know are THING-MINDED. They don't bother to write up or publish what they know. The Crawford slip method is a way to draw it out and get it on paper and into computers. The USC think tank's role in the network can be to capture, organize, document, and transfer know-how.

3. Our proposed system for USC. Our hope is to create a model or operational system for attacking the nationwide problem of low productivity. We would work by the Crawford slip method. We would be the nucleus for a WORKSHOP NETWORK to feed ORGANIZED KNOW-HOW into computers, publishing houses, libraries, and any other know-how distribution systems available. More about this system follows.

4. The interdisciplinary factor. "Any number can play." So can any department in a university, company, or governmental agency. Compartmentalized know-how hinders productivity. Many answers must cross disciplinary and jurisdictional boundaries. Our hope is to recruit and support authorship and networking over a very broad spectrum. Each specialty has something the others very badly need. We hope for broad participation from USC faculty, staff, and graduate students in many fields. We hope for a continued expansion of our interdisciplinary network.

5. Think tank support services. The USC network will need a strong nucleus with enough gravitational pull to hold the interdisciplinary planets in orbit. That

includes a strong editor-in-chief capability and availability. Authorship instruction should be consistent with editorial standards that will prevail in the follow-up to publication. Something like a publications management function goes with the editorial one. Publication outlets must be created or found for new authors. Since electronic publication is on the rise, the computer aspects of the think tank will need attention. That means access to word processing or typesetting equipment and operators. All this has to be housed in scarce office space and provided with dozens of other services. It will naturally start small. It will not spring full grown from the heads of us dreamers.

6. Finances. The modest beginning with an authorship course can be financed by tuition from graduate students or would-be authors from outside organizations. Regular USC faculty and staff who are eligible for free tuition could be assisted as a special bonus. They would be a major asset to the authorship course, not a drag on it, for two reasons: a) We need a LARGE class for the additional richness of mutual exchange. b) Faculty and staff are a superior source of needed professional perspective. Once the authorship instruction takes hold, the expanded effort will need to be financed by grants, special contracts, donations, and bequests. If the dream is a realistic one, and if the operation of the system is successful and credible, we believe the USC fund raisers and grantmanship specialists can help to provide the wherewithal. Success will attract funds.

7. University sponsorship needed. The interdisciplinary factor is so important that the think tank will need sanction and support at high USC levels. Authorship by faculty, staff, and graduate students should be recognized as a valuable asset. The Crawford slip method should be understood well enough at high levels to justify the efforts to teach it and use it in the proposed network. Actual administrative and budgetary responsibility should be vested in some one part of the university. Since the School of Public Administration has already taken significant steps in this direction, we recommend it as the administrative setting for what we propose.

8. The pay-off to USC. We believe our proposal can earn the university's support through benefits to USC. We believe faculty involvement will enhance the university's reputation while it raises the quality of instruction in courses for which they write new materials. We believe staff involvement can help staff members to improve university functions which they analyze for their authorship projects. We believe this outreach to the world of work can bring in significant new enrollments and tuition from persons not now taking courses or using university services. If there is merit in the "publish or perish" concept, let's rewrite it in the affirmative: "Write and publish to help our university and our nation." Similar benefits can come to client organizations whose think tanks we help to set up.

THINK TANKING TO IMPROVE PRODUCTIVITY (WW II JIT FORMAT)

STEPS

- 1 Diagnose the activity
- 2 Penetrate into specifics
- 3 Organize the composite
- 4 Design implementation
- 5 Apply implementation

- 6 Diagnose and refine the new situation

KEY POINTS

Slips on troubles, remedies
Slips on subproblems
Classification, configuration
Manuals, procedures, plans
Publication, instruction,
supervision, management
Upward spiral, same sequence

EVALUATING LEARNERS' TRIAL PERFORMANCES OF THEIR TASKS (WW II JIT FORMAT)

STEPS

- 1 Write specifications and procedures for tasks
- 2 Distribute to learners
- 3 Explain as needed
- 4 Check trial performances
- 5 Give feedback on trials
- 6 Continue to mastery
- 7 Check again at intervals
- 8 Promote to higher duties

KEY POINTS

For products and processes,
step by step
For self-instruction
Accessible for questions
Step by step as printed
Correct, confirm, re-teach
Of product, process, insight
To maintain standards
Upward spiral, same cycle

MANAGING A PRODUCTIVITY IMPROVEMENT PROGRAM (WW II JIT FORMAT)

STEPS

- 1 Authorize analyses
- 2 Train analysts
- 3 Provide safe channels
- 4 Increase input volume
- 5 Manage by penetration
- 6 Unify the mission
- 7 Regulate interactions
- 8 Publish standards
- 9 Accent quality
- 10 Get compliance

KEY POINTS

For upward flow of insights
As authors, editors, think
tankers, problem solvers
Anonymity, independence
Interdisciplinary saturation
Aware of more specifics
Interdisciplinary awareness
and understanding
Standard procedures
Manuals, procedures, policies
Product, process, insight
Control, enforcement

COMPOSING A PARAGRAPH ON SLIPS (WW II JIT FORMAT)

STEPS

- 1 Lay data slips like shingles
- 2 Arrange for sequence
- 3 Underline a heading
- 4 Write printable sentences
- 5 Lay like shingles
- 6 Revise as needed
- 7 Reverse slip sequence
- 8 Clip heading at top
- 9 Refine later

KEY POINTS

To make all visible
Best flow of thought
Physically distinct
Best wordings, flow
For page effect
To polish, refine
As if for typist
Corners evened up
For second thoughts

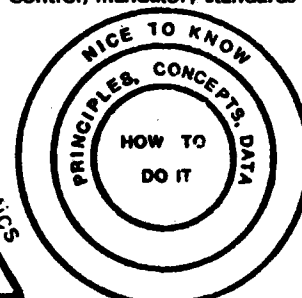
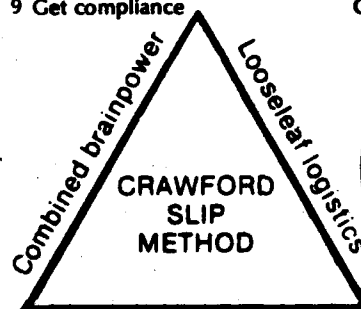
WRITING PROCEDURES FOR TASKS OR INTERACTIONS (WW II JIT FORMAT)

STEPS

- 1 Identify troublesome tasks, interactions
- 2 Get drafts of steps
- 3 Get drafts improved
- 4 Get drafts signed
- 5 Get drafts adopted
- 6 Get drafts edited
- 7 Make procedures known
- 8 Train for application
- 9 Get compliance

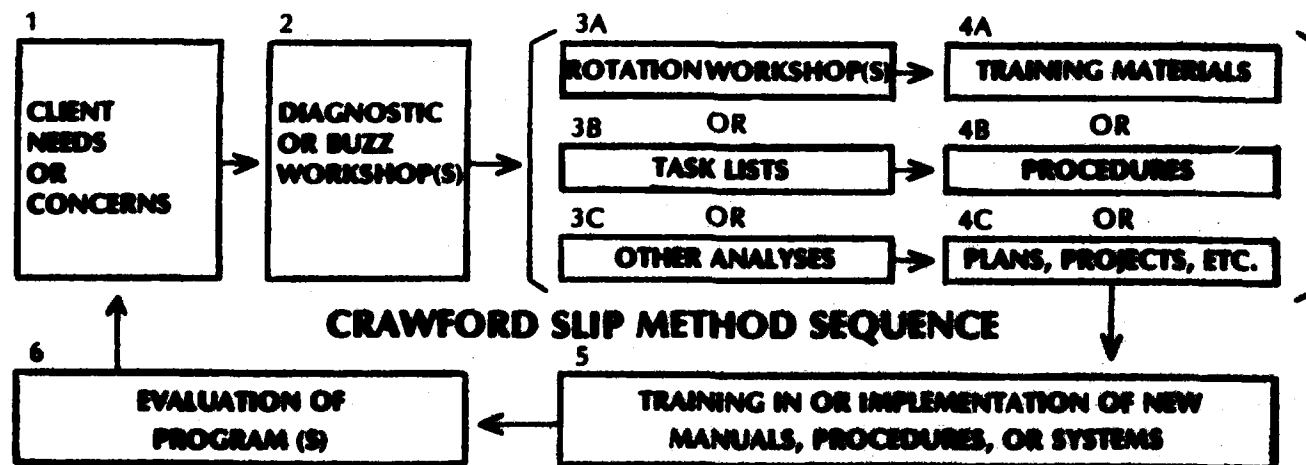
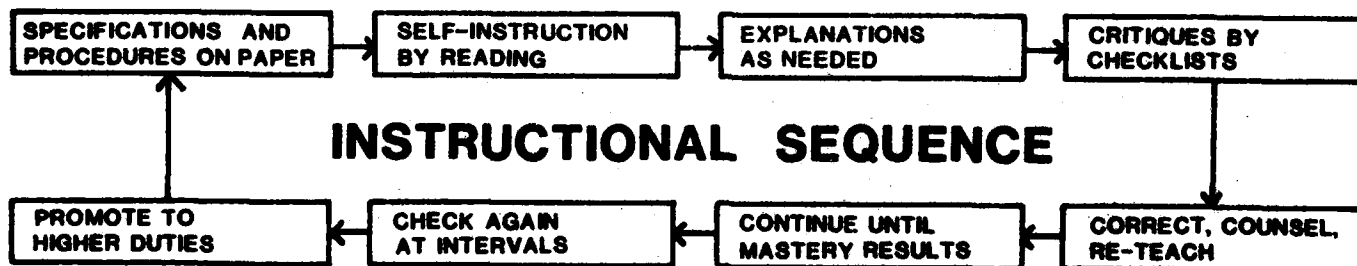
KEY POINTS

Get slips from workshops
Each writes, signs for steps
Peers confer, revise, agree
Improvers sign after agreeing
Approvers are among improvers
For English, technology, legal-
ity, security, public relations
Publish, post, instruct
Self-instruction, supervision
Control, mandatory standards



Improved performance

FOCUS ON PERFORMANCE



END

DATE

FILM

2-89

DTIC